

Digital/McKinsey: Insights

Reinvention through digital



July/August 2017

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The publication offers readers insights on digital transformations and the people, processes, and technologies that are critical to their success.

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Reinvention through digital

In this inaugural issue of *Digital McKinsey Insights*,¹ we consider how companies in both the private and public sector can move beyond just *going* digital to actually *becoming* digital. This shift requires nothing less than a digital reinvention, with companies making bold moves to integrate new technologies and capabilities across different parts of the business.

The challenges they face are many and varied:

- Which digital-transformation efforts will show the most impact most quickly?
- What payoff can we expect from our experiments with new digital tools and capabilities?
- How should we structure our processes differently in a digital world?
- How should we structure our relationships with suppliers, customers, and other stakeholders differently in a digital world?
- How can we scale up pilot projects that have shown early success?

Addressing these questions (and others like them) requires an integrated approach to digital reinvention, something we call the four Ds.

The first, most critical step in a digital transformation is **discovery**, where companies go through a process of shaping their digital ambition, strategy, and business case based on a deep and broad analysis of trends and capabilities. In the **design** step, companies must reinvent and prototype new capabilities and customer journeys. (This is where the introduction of agile methodologies and digital technologies can have the most impact.) In the third step, companies activate an ecosystem of external partners to **deliver** products quickly and at scale. Throughout this process, companies must **de-risk** their projects—structuring their change programs, resources, and commercial models to reduce operational and financial risk.

Read on to learn more about the four Ds. We hope this framework and this collection of articles will help clear your path toward digital reinvention. Please share your feedback with us at digitalmckinsey@mckinsey.com.

¹ Editor's note: To longtime readers of *McKinsey on Business Technology*, welcome to our revamped design and direction for the publication. The name, look, and feel are a bit different, but the content remains focused on addressing executives' biggest questions on the use of technology. We hope you enjoy the issue.



Daniel Forero

The case for digital reinvention

Jacques Bughin, Laura LaBerge, and Anette Mellbye

Digital technology, despite its seeming ubiquity, has only begun to penetrate industries. As it continues its advance, the implications for revenues, profits, and opportunities will be dramatic.

As new markets emerge, profit pools shift, and digital technologies pervade more of everyday life, it's easy to assume that the economy's digitization is already far advanced. According to our latest research, however, the forces of digital have yet to become fully mainstream. On average, industries are less than 40 percent digitized, despite the relatively deep penetration of these technologies in media, retail, and high tech.

As digitization penetrates more fully, it will dampen revenue and profit growth for some, particularly the bottom quartile

of companies, according to our research, while the top quartile captures disproportionate gains. Bold, tightly integrated digital strategies will be the biggest differentiator between companies that win and companies that don't, and the biggest payouts will go to those that initiate digital disruptions. Fast followers with operational excellence and superior organizational health won't be far behind.

These findings emerged from a research effort to understand the nature, extent, and top-management implications of the progress of digitization. We tailored our

efforts to examine its effects along multiple dimensions: products and services, marketing and distribution channels, business processes, supply chains, and new entrants at the ecosystem level (for details, see sidebar “About the research”). We sought to understand how economic performance will change as digitization continues its advance along these different dimensions. What are the best-performing companies doing in the face of rising pressure? Which approach is more important as digitization progresses: a great strategy with average execution or an average strategy with great execution?

The research and survey findings, taken together, amount to a clear mandate to act decisively, whether through the creation of new digital businesses or by reinventing the core of today’s strategic, operational, and organizational approaches.

More digitization—and performance pressure—ahead

According to our research, digitization has

only begun to transform many industries (Exhibit 1). Its impact on the economic performance of companies, while already significant, is far from complete.

This finding confirms what many executives may already suspect: by reducing economic friction, digitization enables competition that pressures revenue and profit growth. Current levels of digitization have already taken out, on average, up to six points of annual revenue and 4.5 points of growth in earnings before interest and taxes (EBIT). And there’s more pressure ahead, our research suggests, as digital penetration deepens (Exhibit 2).

While the prospect of declining growth rates is hardly encouraging, executives should bear in mind that these are *average* declines across *all* industries. Beyond the averages, we find that performance is distributed unequally, as digital further separates the high performers from the also-rans. This finding is consistent with a separate McKinsey research stream,

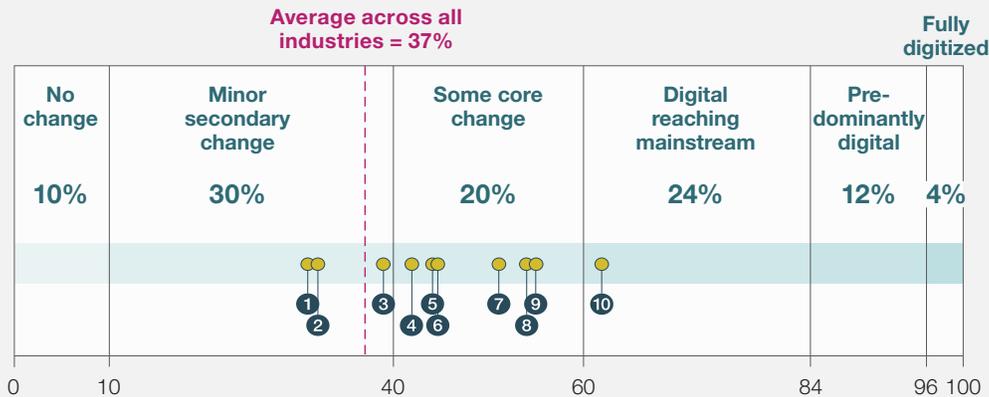
About the research

To go beyond the descriptive statistics that limit the relevance of so much survey research, we built a causal model of digital performance. The model’s first input, from the survey itself, conveyed the current level of digitization (as reported by companies) in each of five dimensions: products and services, marketing and distribution channels, business processes, supply chains, and new entrants at the ecosystem level. The second input from the survey was the level of response companies had taken, and planned to take, on those dimensions, as well as their core enabling strategic and organizational capabilities.

We then modeled average growth in revenue and earnings before interest and taxes for all companies in the sample at current and full digitization, based on survey respondents’ perceptions of their companies’ responses to digitization, postulating causal links, and calculating their magnitude through both linear- and probit-regression techniques, controlling for industry, company size, geography, and type of customer segment (B2B or B2C).

EXHIBIT 1 Digital is penetrating all sectors, but to varying degrees.

Perception of digital penetration by industry,¹ % of respondents



Selected industries²

- ① Consumer packaged goods (31%)
- ② Automotive and assembly (32%)
- ③ Financial services (39%)
- ④ Professional services (42%)
- ⑤ Telecommunications (44%)
- ⑥ Travel, transport, and logistics (44%)
- ⑦ Healthcare systems and services (51%)
- ⑧ High tech (54%)
- ⑨ Retail (55%)
- ⑩ Media and entertainment (62%)

¹Data reflect average of respondents' ratings on degree of change in the past 3 years within each industry across 5 dimensions (products, marketing and distribution, processes, supply chains, and new entrants at the ecosystem level).

²For consumer packaged goods, n = 85; automotive and assembly, n = 112; financial services, n = 310; professional services, n = 307; telecommunications, n = 55; travel, transport, and logistics, n = 103; healthcare systems and services, n = 78; high tech, n = 348; retail, n = 89; and media and entertainment, n = 86.

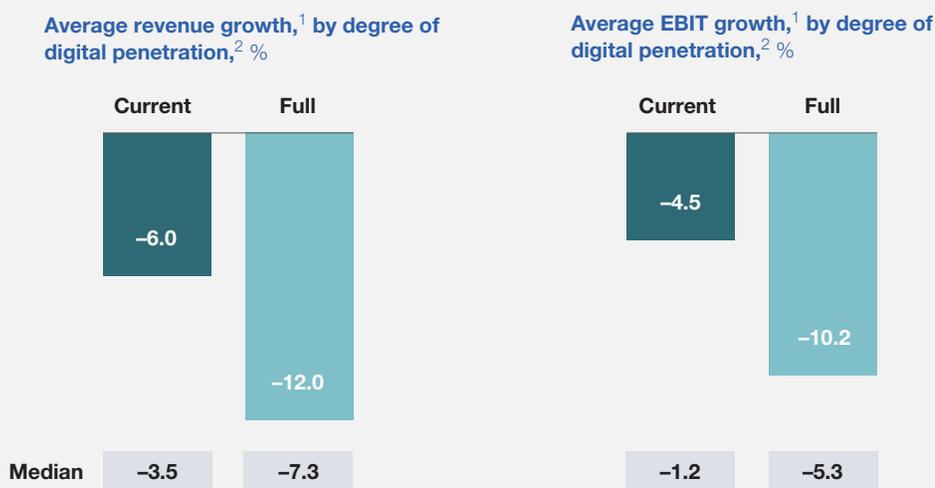
which also shows that economic performance is extremely unequal. Strongly performing industries, according to that research, are three times more likely than others to generate market-beating economic profit. Poorly performing companies probably won't thrive no matter which industry they compete in.¹

At the current level of digitization, median companies, which secure three additional points of revenue and EBIT growth, do better than average ones, presumably because the long tail of companies hit hard by digitization pulls down the mean. But our survey results suggest that as digital increases economic pressure, all companies, no matter what

¹ Chris Bradley, Angus Dawson, and Sven Smit, "The strategic yardstick you can't afford to ignore," *McKinsey Quarterly*, October 2013, McKinsey.com.

EXHIBIT 2

Digitization is putting pressure on revenue and profit growth.



¹We based our model of average growth in revenues and earnings before interest and taxes (EBIT) at current and full digitization on survey respondents' perceptions of their companies' responses to digitization, postulating causal links, and calculating their magnitude through both linear- and probit-regression techniques.

²Digital penetration estimated using survey responses; average digital penetration across industries currently = 37%.

their position on the performance curve may be, will be affected.

Uneven returns on investment

That economic pressure will make it increasingly critical for executives to pay careful heed to where—and not just how—they compete and to monitor closely the return on their digital investments. So far, the results are uneven. Exhibit 3 shows returns distributed unevenly: some players in every industry are earning outsized returns, while many others in the same industries are experiencing returns below the cost of capital.

These findings suggest that some companies are investing in the wrong places or investing too much (or too little) in the right ones—or simply that their returns on digital investments are being

competed away or transferred to consumers. On the other hand, the fact that high performers exist in every industry (as we'll discuss further in a moment) indicates that some companies are getting it right—benefiting, for example, from cross-industry transfers, as when technology companies capture value in the media sector.

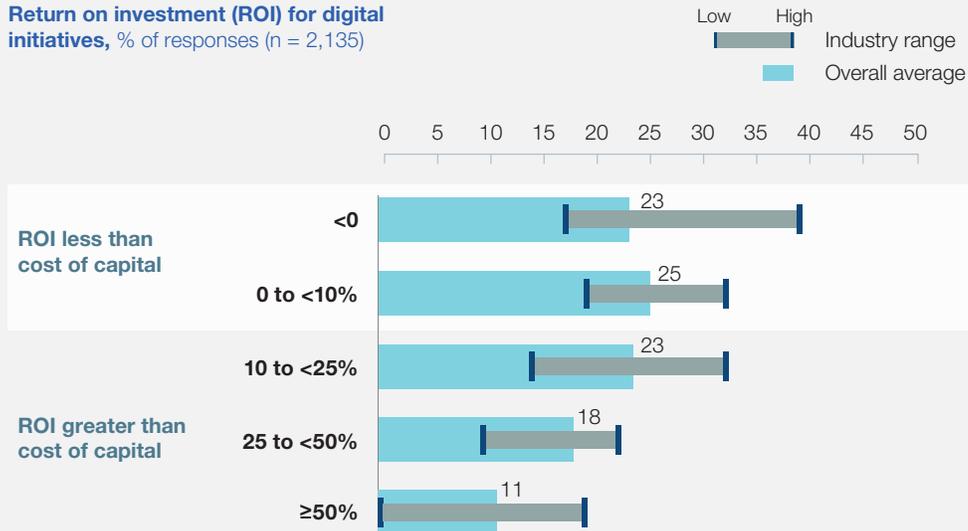
Where to make your digital investments

Improving the return on investment of digital investments requires precise targeting along the dimensions where digitization is proceeding. Digital has widely expanded the number of available investment options, and simply spreading the same amount of resources across them is a losing proposition. In our research, we measured five separate dimensions of digitization's advance into industries: products

EXHIBIT 3

Some digital initiatives generate attractive returns, while others don't return their cost of capital.

Return on investment (ROI) for digital initiatives, % of responses (n = 2,135)



and services, marketing and distribution channels, business processes, supply chains, and new entrants acting in ecosystems.

How fully each of these dimensions has advanced, and the actions companies are taking in response, differ according to the dimension in question. And there appear to be mismatches between opportunities and investments. Those mismatches reflect advancing digitization's uneven effect on revenue and profit growth, because of differences among dimensions as well as among industries. Exhibit 4 describes the rate of change in revenue and EBIT growth that appears to be occurring as industries progress toward full digitization. This picture, combining the data for all of the industries we studied, reveals that today's average level of digitization,

shown by the dotted vertical line, differs for each dimension. Products and services are more digitized, supply chains less so.

To model the potential effects of full digitization on economic performance, we linked the revenue and EBIT growth of companies to a given dimension's digitization rate, leaving everything else equal. The results confirm that digitization's effects depend on where you look. Some dimensions take a bigger bite out of revenue and profit growth, while others are digitizing faster. This makes intuitive sense. As platforms transform industry ecosystems, for example, revenues grow—even as platform-based competitors put pressure on profits. As companies digitize business processes, profits increase, even though little momentum in top-line growth accompanies them.

EXHIBIT 4 Products are more digitized, while supply chains are less so.

Effect of digitization on EBIT¹ and revenue relative to current growth trajectory (represented as 0),² % difference

Note: y axes scale to different values



¹Earnings before interest and taxes.

²We based our model of average growth in revenue and EBIT at current and full digitization on survey respondents' perceptions of their companies' responses to digitization, postulating causal links, and calculating their magnitude through both linear- and probit-regression techniques.

³Weighted average for industries whose respondents replied on each of the 5 dimensions, reflecting a subset of total respondents surveyed. Unweighted average level of digitization across industries for all respondents = 37%.

The biggest future impact on revenue and EBIT growth, as Exhibit 4 shows, is set to occur through the digitization of supply chains. In this dimension, full digitization contributes two-thirds (6.8 percentage points of 10.2 percent) of the total projected hit to annual revenue growth and more than 75 percent (9.4 out of 12 percent) to annual EBIT growth.

Despite the supply chain's potential impact on the growth of revenues and profits, survey respondents say that their companies aren't yet investing heavily in this dimension. Only 2 percent, in fact, report that supply chains are the focus of their forward-looking digital strategies (Exhibit 5), though headlining examples such as Airbnb and Uber

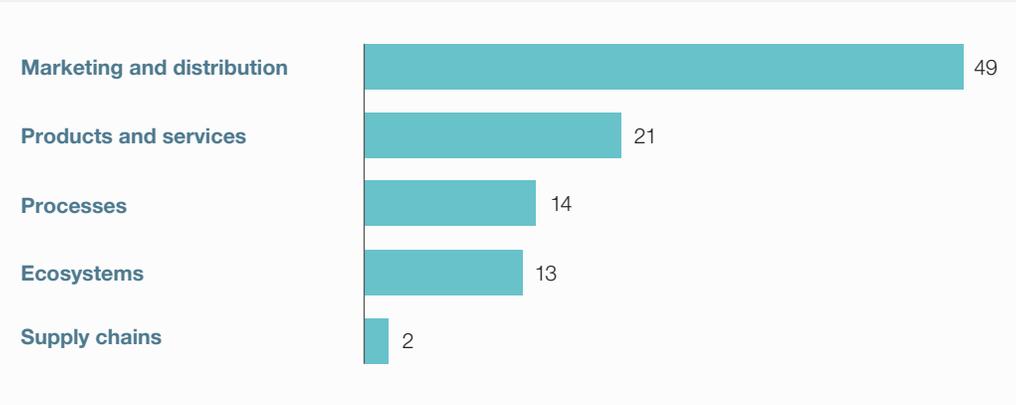
demonstrate the power of tapping previously inaccessible sources of supply (sharing rides or rooms, respectively) and bringing them to market. Similarly, there is little investment in the ecosystems dimension, where hyperscale businesses such as Alibaba, Amazon, Google, and Tencent are pushing digitization most radically, often entering one industry and leveraging platforms to create collateral damage in others.²

Instead, the survey indicates that distribution channels and marketing are the primary focus of digital strategies (and thus investments) at 49 percent of companies. That focus is sensible, given the extraordinary impact digitization has already had on customer interactions and

² For more about the supply-and-demand vectors through which disruptive threats and opportunities emerge, see Angus Dawson, Martin Hirt, and Jay Scanlan, "The economic essentials of digital strategy," *McKinsey Quarterly*, March 2016, McKinsey.com.

EXHIBIT 5 Where are companies focusing their forward-looking digital strategies?

% of respondents



Structuring your digital reinvention

Leading companies invest more boldly in digital than their less well-performing counterparts do, according to McKinsey's 2016 digital survey. They also invest more *broadly* by targeting each dimension in which digitization is rapidly advancing: products and distribution, business processes, supply chains, and ecosystems. As executives look to deepen and broaden the digital reinvention of their own companies, they may benefit from a structured process grouped around *discovering*, *designing*, *delivering*, and *de-risking* their digital investments. Let's look at each of these in turn.

Since industry effects account for two-thirds of a company's variation from average economic profit, according to McKinsey analysis, executives must *discover* the industry-level insights needed to identify sources of disruption as markets evolve. By grounding their insights in supply-and-demand shifts, they can more clearly recognize the vectors where disruption originates.¹ This reinvention phase also requires companies to assess the capabilities they must have to realize their strategic aspirations so that they can identify critical needs: cloud-based solutions, personalization and analytics, agile techniques, performance optimization, or something else.

Given the broad scope of the investment required, digital reinventions mandate an end-to-end *design* of business processes, with close attention to customer use cases, IT requirements, and organizational elements (such as structure, talent, incentives, and culture). The output of this work is a digital blueprint to address capability gaps and to recruit, develop, provide incentives for, and retain the necessary talent. The resulting implementation plan prioritizes the initiatives that generate the greatest economic value.

With these essentials in place, a digital reinvention must now *deliver* the capabilities needed to meet a company's strategic goals. No organization will have all the capabilities it needs within its own walls. Executives must therefore develop an ecosystem of external teams, partners, suppliers, and customers, including a mix of platform players, delivery specialists, and niche outfits with specific industry expertise and capabilities. The reinvention team must not only play "air-traffic controller" for the project's numerous moving parts but also have the credibility and skill to solve problems along the many facets of the business.

Across all of these stages, executives can structure the process to minimize risk. Cybersecurity is one obvious area of focus. Companies can further *de-risk* their reinventions by embracing DevOps, in which teams learn to automate tests for software, establish systems that roll back failures in seconds, and make fixes without putting significant parts of the business at risk.²

¹ Angus Dawson, Martin Hirt, and Jay Scanlan, "The economic essentials of digital strategy," *McKinsey Quarterly*, March 2016, McKinsey.com.

² For more about integrating DevOps into the core of your business, see Satty Bhens, Ling Lau, and Shahar Markovitch, "Finding the speed to innovate," April 2015, McKinsey.com.

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the power of digital tools to target marketing investments precisely. By now, in fact, this critical dimension has become “table stakes” for staying in the game. Standing pat is not an option.

The question, it seems, looking at exhibits 4 and 5 in combination, is whether companies are overlooking emerging opportunities, such as those in supply chains, that are likely to have a major influence on future revenues and profits. That may call for resource reallocation. In general, companies that strategically shift resources create more value and deliver higher returns to shareholders.³ This general finding could be even more true as digitization progresses.

On the front foot

Our survey results also suggest companies are not sufficiently bold in the magnitude and scope of their investments (see sidebar “Structuring your digital reinvention”).

Our research (Exhibit 6) suggests that the more aggressively they respond to the digitization of their industries—up to and including initiating digital disruption—the better the effect on their projected revenue and profit growth. The one exception is the ecosystem dimension: an overactive response to new hyperscale competitors actually lowers projected growth, perhaps because many incumbents lack the assets and capabilities necessary for platform strategies.

As executives assess the scope of their investments, they should ask themselves if they have taken only a few steps forward in a given dimension—by digitizing their existing customer touchpoints, say. Others might find that they have acted more significantly by

digitizing nearly all of their business processes and introducing new ones, where needed, to connect suppliers and users.

To that end, it may be useful to take a closer look at Exhibit 6, which comprises six smaller charts. The last of them totals up actions companies take in each dimension of digitization. Here we can see that the most assertive players will be able to restore more than 11 percent of the 12 percent loss in projected revenue growth, as well as 7.3 percent of the 10.4 percent reduction in profit growth. Such results will require action across all dimensions, not just one or two—a tall order for any management team, even those at today’s digital leaders.

Looking at the digital winners

To understand what today’s leaders are doing, we identified the companies in our survey that achieved top-quartile rankings in each of three measures: revenue growth, EBIT growth, and return on digital investment.

We found that more than twice as many leading companies closely tie their digital and corporate strategies than don’t. What’s more, winners tend to respond to digitization by changing their corporate strategies significantly. This makes intuitive sense: many digital disruptions require fundamental changes to business models. Further, 49 percent of leading companies are investing in digital more than their counterparts do, compared with only 5 percent of the laggards, 90 percent of which invest less than their counterparts. It’s unclear which way the causation runs,

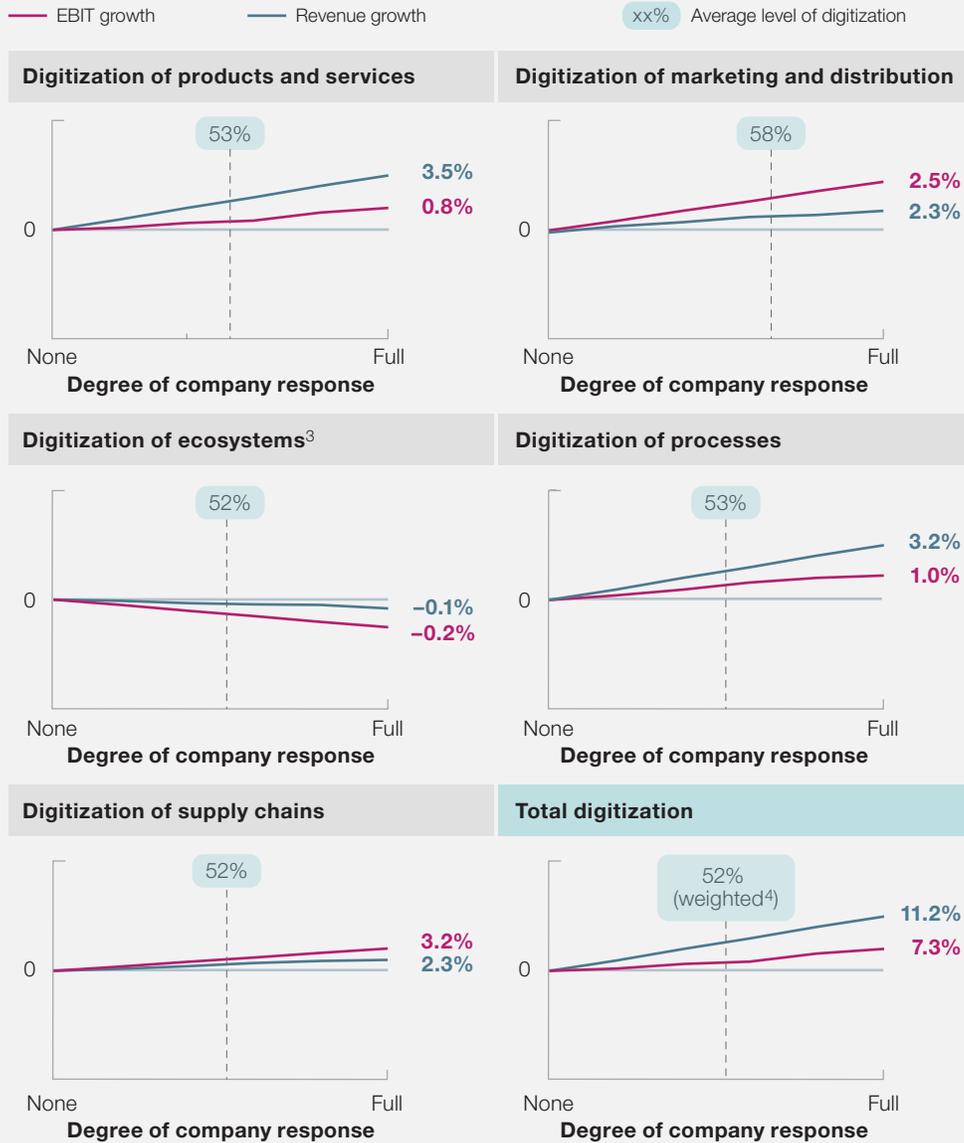
³ Stephen Hall, Dan Lovallo, and Reinier Musters, “How to put your money where your strategy is,” *McKinsey Quarterly*, March 2012, McKinsey.com.

EXHIBIT 6

When companies respond to digitization assertively and across multiple dimensions, they improve their performance.

Effect of company response to digitization on EBIT¹ and revenue relative to current growth trajectory (represented as 0),² % difference

Note: y axes scale to different values



¹Earnings before interest and taxes.

²We based our model of average growth in revenue and EBIT at current and full digitization on survey respondents' perceptions of their companies' responses to digitization, postulating causal links, and calculating their magnitude through both linear- and probit-regression techniques.

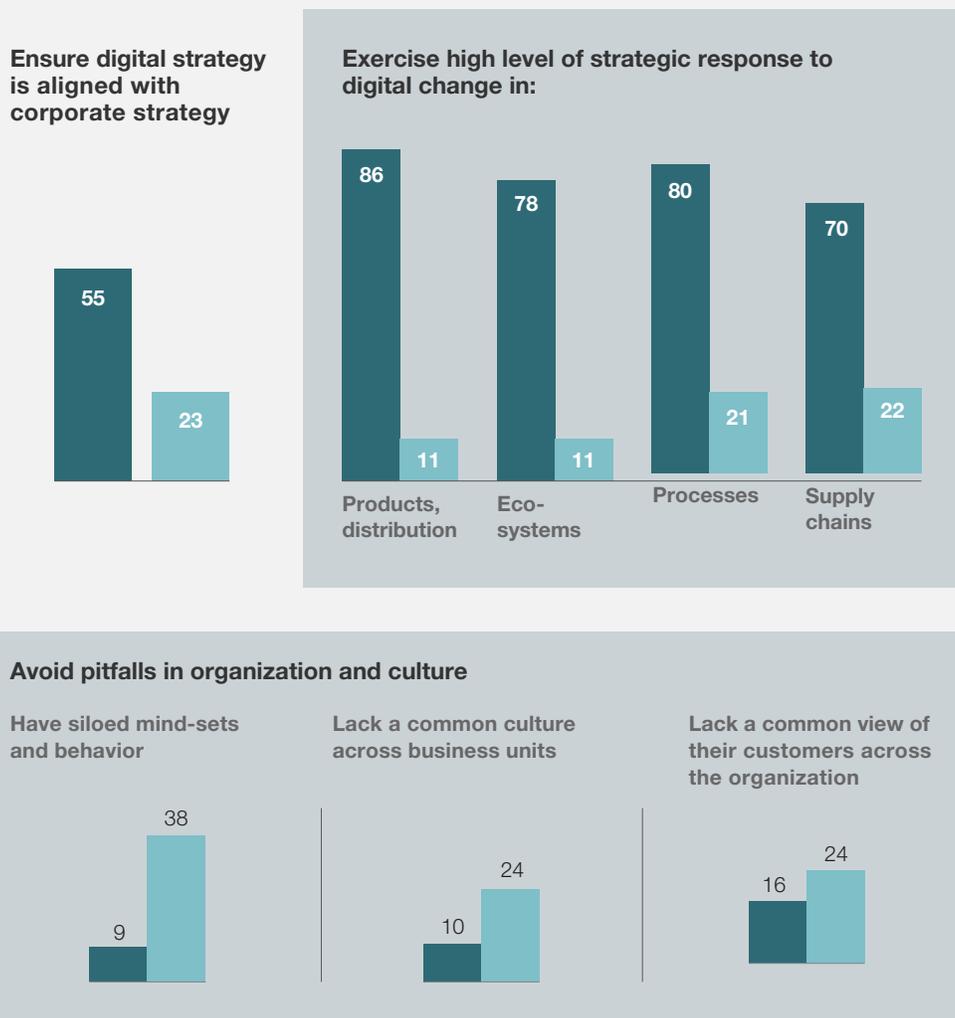
³Overactive response to new competitors in ecosystems can actually lower projected growth.

⁴Weighted average for industries whose respondents replied on each of the 5 dimensions, reflecting a subset of total respondents surveyed. Unweighted average level of digitization across industries for all respondents = 37%.

EXHIBIT 7 This is what leading companies do differently from the rest.

% of respondents¹
(n = 2,135)

■ Winners ■ Others



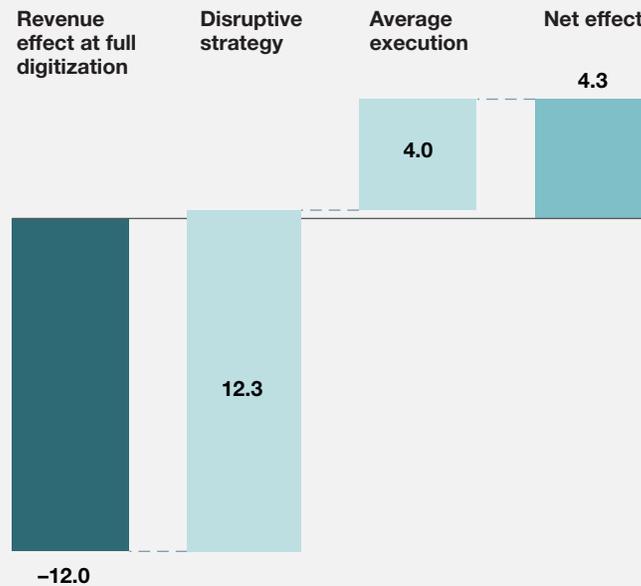
of course, but it does appear that heavy digital investment is a differentiator.

Leading companies not only invested more but also did so across *all* of the

dimensions we studied. In other words, winners exceed laggards in both the *magnitude* and the *scope* of their digital investments (Exhibit 7). This is a critical element of success, given the different

EXHIBIT 8 Disruptive strategies are a powerful response to intense digitization.

Revenue-growth profile, %



rates at which these dimensions are digitizing and their varying effect on economic performance.

Strengths in organizational culture underpin these bolder actions. Winners were less likely to be hindered by siloed mind-sets and behavior or by a fragmented view of their customers. A strong organizational culture is important for several reasons: it enhances the ability to perceive digital threats and opportunities, bolsters the scope of actions companies can take in response to digitization, and supports the coordinated execution of those actions across functions, departments, and business units.

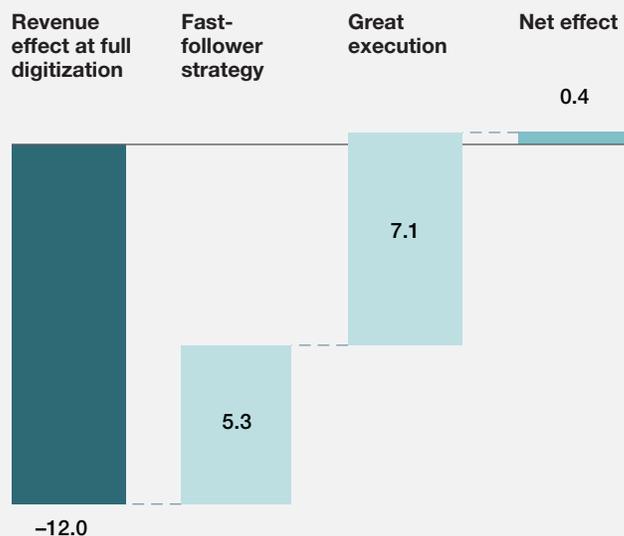
Bold strategies win

So we found a mismatch between today’s digital investments and the dimensions in which digitization is most significantly affecting revenue and profit growth. We also confirmed that winners invest more, and more broadly and boldly, than other companies do. Then we tested two paths to growth as industries reach full digitization.

The first path emphasizes strategies that change a business’s scope, including the kind of pure-play disruptions the hyperscale businesses discussed earlier generate. As Exhibit 8 shows, a great strategy can by itself retrieve all of the revenue growth lost, on average, to full digitization—at least in the

EXHIBIT 9 Fast following and great execution are the next best thing to disruption.

Revenue-growth profile, %



aggregate industry view. Combining this kind of superior strategy with median performance in the nonstrategy dimensions of McKinsey’s digital-quotient framework—including agile operations, organization, culture, and talent—yields total projected growth of 4.3 percent in annual revenues. (For more about how we arrived at these conclusions, see sidebar “About the research.”)

Most executives would fancy the kind of ecosystem play that Alibaba, Amazon, Google, and Tencent have made on their respective platforms. Yet many recognize

that few companies can mount disruptive strategies, at least at the ecosystem level. With that in mind, we tested a second path to revenue growth (Exhibit 9).

Companies in this profile lack a disruptive strategic posture but compensate by being in the top 25 percent for all the other elements of digital maturity.⁴ This fast-follower profile allows more room for strategic error—you don’t have to place your bets quite so precisely. It also increases the premium on how well you execute. The size of the win is just slightly positive at 0.4 percent in annual revenue

⁴ For more about digital maturity, see Tanguy Catlin, Jay Scanlan, and Paul Willmott, “Raising your Digital Quotient,” *McKinsey Quarterly*, June 2015, McKinsey.com.

growth: 5.3 percent from good (but not best-in-class disruptive) strategy and an additional 7.1 percent through top-quartile digital maturity. This is probably good news for incumbents, since many of them are carefully watching tech start-ups (such as those in fintech) to identify the winning plays and then imitating them at their own bigger scale. That approach, to be sure, demands cutting-edge agility to excel on all the operational and organizational aspects of digital maturity.



In the quest for coherent responses to a digitizing world, companies must assess how far digitization has progressed along multiple dimensions in their industries and the impact that this evolution is having—and will have—on economic performance. And they must act on each of these dimensions with bold, tightly integrated strategies. Only then will their investments match the context in which they compete. ◆

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The seven decisions that matter in a digital transformation: A CEO's guide to reinvention

Peter Dahlström, Driek Desmet, and Marc Singer

A successful digital transformation requires making trade-off decisions. Here's how successful CEOs guide their business's reinvention.

Being the CEO of a large company facing digital disruption can seem like being a gambler at a roulette table. You know you need to place bets to win, but you have no idea where to put your chips.

Of course, digital transformations aren't games of chance. But they do require big and bold commitments in the midst of uncertainty in order to reinvent the business rather than just improve it.

Many of the digital initiatives large incumbents have already tried to date have tended to operate at the margins of the business. Innovation labs or apps can be useful for learning and can even provide a boost to the company. Meanwhile, the legacy business remains in place, largely unperturbed.

Without a transformation of the core—the value proposition, people, processes, and technologies that are the lifeblood of the

business—any digital initiative is likely to be a short-term fix. The legacy organization will inevitably exert a gravitational pull that drives a reversion to established practices. Reinvention of a business is, by its nature, bold. But it's one thing to be bold; it's another to be thoughtfully bold. A digital reinvention requires the CEO to make tough decisions, which involve hard trade-offs that are tempting to ignore, defer, or rush into. Yet knowing which decisions to prioritize and how to implement them can make the difference between a successful transformation effort and one that struggles.

These decisions occur in the four phases of a successful digital transformation program:

- discovering the ambition for the business based on where value is migrating
- designing a transformation program that targets profitable customer journeys
- delivering the change through an ecosystem of partners
- de-risking the transformation process to maximize the chances of success

In each of these areas, the CEO has a lot to do, from modeling new behavior to driving a change in culture to executing strategy.¹ This article focuses on some of the big decisions CEOs need to make, and how they can go about making them. Based on our experience with dozens of digital

transformations, we believe these seven decisions are the most important ones.

DISCOVER—Set the ambition for the business.

Decision 1: Where the business should go

Few decisions are more momentous than choosing the business direction. While the almost existential nature of this decision can seem overwhelming, most incumbents don't have a choice, since they are already facing disruptions that can threaten their long-term viability.

Data and analysis, as well as a disciplined framework for thinking through options, provide a helpful structure for making the decision. As a starting point, we recommend a thoughtful review of the market and business based on those stalwarts of economic analysis, supply and demand.²

It's important that any analysis be dynamic and forward-looking, based on an understanding of how digital technology could lead to changes in the future.

Almost every notable digital innovation we've seen has been based on using connectivity and data to transform the customer experience or to reshape products and services by allowing customers to interact with them in new ways. So that's a good basis for thinking through the possibilities. Incumbents can also look to approaches used by digital innovators—both within and outside their sectors—to spur fresh thinking.³

¹ Carolyn B. Aiken and Scott P. Keller, "The CEO's role in leading transformation," February 2007, McKinsey.com, is a seminal piece on transformations. The points made in it remain true in the digital age.

² Angus Dawson, Martin Hirt, and Jay Scanlan, "Economic essentials of digital strategy," *McKinsey Quarterly*, March 2016, McKinsey.com.

³ *Ibid.* Innovators have used a range of approaches, including rethinking the nature of customer demand, tapping into previously underutilized sources of supply, launching wholly new value propositions based on reimagined business systems, or leveraging new digital platforms.

While analysis is crucial, it is no substitute for imagination. C.S. Lewis called imagination “the organ of meaning,” and CEOs need to tap into it. One approach might be to imagine how the industry would work if it were completely digitized.⁴ Often, a creative leap is needed to identify how the company might serve customers in new ways across their entire journey. We have found 24-hour hackathons with senior leaders to be a very effective way to break through old thinking and encourage executives to adopt completely new ways of doing things.⁵

GE is an example of an incumbent that envisioned how its industry would evolve and acted in response. CEO Jeff Immelt noted that “15 percent or 20 percent of the S&P 500 valuation is consumer Internet stocks that didn’t exist 15 or 20 years ago. The consumer companies got none of that ... If you look out 10 or 15 years ... that same value is going to be created in the industrial Internet.”⁶ Based on this insight, GE launched GE Digital, a software and analytics group that works closely with all the company’s business units, and Predix, a branded digital platform that invites developers to build new applications using GE data.

DESIGN—Create a plan for the digital transformation.

Decision 2: Who will lead the effort

A program that will deliver the needed degree of transformation is not something CEOs can delegate; they must lead the charge themselves.

Some CEOs, like Daniel Gilbert, cofounder of Quicken Loans, serve as the public face

of the company’s digital-transformation program. Gilbert was the primary evangelist for Quicken’s Rocket Mortgage initiative, touting it as the “mortgage industry’s iPhone moment.”⁷

CEOs, however, can’t do this on their own. Like the conductor of an orchestra, the CEO provides vision and ongoing direction. But a group of other senior leaders needs to drive the effort day-to-day. Thus a key decision for the CEO is selection of the members of the orchestra, based on the skills needed to be harmonious and effective.

One criterion for inclusion, naturally, has to be skill in and knowledge of digital. That’s why some CEOs turn to a chief digital officer (CDO). Appointing a CDO is the right answer for many companies, but it’s only part of the solution.

This decision needs to extend to putting in place the right team of people to drive the change. Since digital affects almost every aspect of the business and requires an unprecedented level of coordination across the entire organization, any leadership group has to include executives from multiple functions. While it can be important to have people who are visionary and inspiring, the team will also need respected executives with a deep understanding of the mechanics of the business, as well as expertise in change management. In addition, the CEO should select leaders who embody and will forward the key values of a digital culture: customer-centricity, a collaborative mind-set, and a tolerance for risk.

⁴ Chris Bradley and Clayton O’Toole, “An incumbent’s guide to digital disruption,” *McKinsey Quarterly*, May 2016, McKinsey.com, offers a structured framework for analyzing the potential impact of digital technologies on an industry.

⁵ Ferry Grijpink, Alan Lau, and Javier Vara, “Demystifying the hackathon,” October 2015, McKinsey.com.

⁶ Rik Kirkland, “GE’s Jeff Immelt on digitizing in the industrial space,” October 2015, McKinsey.com.

⁷ “Get a mortgage ‘Rocket’ fast: Quicken Loans chairman,” CNBC, January 12, 2016, cnbc.com; Matt Burns, “This could be the mortgage industry’s iPhone moment,” *Techcrunch*, November 24, 2015, techcrunch.com.

This leadership team doesn't need to be large. In fact, it can be quite small, as long as its members, and the people working with them, have the requisite skills. At Starbucks, for example, Howard Schultz had the CIO and CDO guide a decade-long digitization effort that has driven widespread adoption of mobile payments at North American stores, tightly coupled with the company's customer-loyalty program.⁸ At a European energy company, it was a COO, chief marketing officer, and chief sales officer who led the charge.

Decision 3: How to 'sell' the vision to key stakeholders

Any change effort requires active communication of the vision and an explanation of why it's necessary. For this reason, the CEO needs to decide not only what to say but also how—and how long—to communicate.

One approach is to think of the change program as a product and brand it. When Angela Ahrendts took over as CEO of Burberry, she launched a bold Art of the Trench campaign and an aggressive move into digital, which signaled her high level of ambition and rejuvenated the organization. In early 2014, Ralph Hamers, CEO of ING Group, announced his vision for the company, called Think Forward, Act Now. Its goal was to deliver a differentiating customer experience through faster innovation and better use of analytics. Late in 2016, Hamers updated the vision with Accelerating Think Forward, which focused on mobile banking.⁹

It's crucial to decide when to communicate and with whom. The CEO should focus first on winning over influencers both inside and outside the company, then on propagating the change to their networks. CEOs also need to adopt

a campaign mentality. This means delivering crisp and clear messages, in a steady cadence, using all relevant formats and channels. It's an influencing program, so messages need to be tailored to each audience—from employees to the board to shareholders.

A bold, long-term orientation, well communicated to all key stakeholders, can be a crucial counterbalance against pressures to hit short-term financial targets once the transformation program begins.

Decision 4: Where to position the company within the digital ecosystem

New companies are able to challenge established businesses because an ecosystem of relatively cheap and plentiful resources—from technologies to platforms to vendors—is in place. This has been a boon to disruptive attackers, but the same resources can be used by incumbents, too.

CEOs need to figure out which capabilities, skills, and technologies available in the ecosystem complement and support their business's strategic ambitions. How much to rely on these relationships and how to structure them are also crucial decisions. Making them requires a clear sense of how to secure the company's most valuable assets, such as relationships with customers or data.

Michael Busch, the CEO of Thalia, Germany's leading bookstore, systematically evaluated the entire supply chain before launching his company's digital book offering. He created a network of alliances with other book retailers and partnered with Deutsche Telekom, which provided the technology and digital distribution backbone. He did not, however, make any

⁸ Michael Fitzgerald, "How Starbucks Has Gone Digital," *Sloan Management Review*, April 4, 2013, sloanreviewmit.edu.

⁹ "ING strategy update: Accelerating Think Forward," ING Newsroom, October 3, 2016, ing.com.

agreements that separated Thalia from its customers, which it saw as its core value.

Over the past decade, BBVA Compass, a Spanish bank with a growing global presence, has aggressively remade itself into a digital organization.¹⁰ In 2016, it launched an API marketplace, which allows fintech start-ups to build apps that interface with BBVA's back-end systems. This arrangement channels the energy and creativity of entrepreneurs while ensuring that BBVA retains a leadership position within the ecosystem.

Decision 5: How to decide during the transformation

As boxer Mike Tyson once said, echoing Joe Louis, "Everyone has a plan 'til they get punched in the mouth."¹¹ No matter how well a transformation effort is designed, there will be surprises and unforeseen developments. To deal with this reality, the CEO and top team need to decide on governance and escalation rules to allow for inevitable course corrections.

Frequent check-ins—at least weekly—with senior leaders should be planned to gauge whether the digitization effort is on course and to institute changes if it is not. That sounds like a lot, but devoting even one hour a week to a program that transforms the company is just 1 to 2 percent of a CEO's time. The challenge is to book this time and stick to it.

To support this approach, the CEO needs a dashboard developed to track progress on key initiatives that reflect the ambitions of the

transformation. A digital transformation is a long-term effort, and as a result, yardsticks that focus on the short term, like return on investment, can be misleading. Nontraditional metrics that evaluate digital adoption, such as new registrations on digital channels or digital-engagement levels, are better gauges of the progress of a digital transformation.¹²

DELIVER—Execute the transformation plan, allowing for ongoing adaptation and adjustment.

Decision 6: How to allocate funds rapidly and dynamically

The key lever CEOs and senior teams have to drive a digital transformation is resource allocation. This isn't just about making sure resources get to the right places, a decision CEOs already make as part of their everyday work. With a digital transformation, the CEO needs to decide what the allocation process should be and at what tempo it should operate.

Our research shows that raising a company's Digital Quotient, or DQ, requires targeted allocation of both capital and operating expenditures.¹³ The CEO and top team should act like venture capitalists by following a digital initiative's progress closely, pulling the plug on projects that fail to meet expectations, and investing more in those that do well.

This requires speeding up budgeting processes, which at large companies tend to follow annual cycles. During a digital transformation, budgeting should shift from annual to quarterly or even monthly cycles.

¹⁰Catherine Lawson, "Francisco González on reinventing finance in the digital age," *Wired UK*, June 22, 2015, wired.co.uk.

¹¹Samuel Ha, "Top 30 greatest Mike Tyson quotes," mightyfighter.com.

¹²Karel Dörner and Jürgen Meffert, "Nine questions to help you get your digital transformation right," October 2015, McKinsey.com.

¹³Tanguy Catlin, Jay Scanlan, and Paul Willmott, "Raising your digital quotient," *McKinsey Quarterly*, June 2015, McKinsey.com.

Succeeding with a digital transformation often requires cutting budgets for legacy operations. In the midst of its transformation effort, a large bank realized that even after making massive investments in digital, branches still accounted for 90 percent of its operating expenses—and that 70 to 80 percent of the transactions done in branches could be executed digitally. In response, they shifted almost all future capital spending to digital, closed a number of branches, and launched a program to migrate customers who relied on branches for routine services to ATMs or web/mobile channels.

DE-RISK—Increase the transformation's prospects for success.

Decision 7: What to do when

More than 70 percent of transformation programs fail.¹⁴ While the decisions covered in this article go a long way toward improving the odds, loss of momentum can undo even the best transformation efforts. To forestall that possibility, CEOs should carefully decide how to sequence the transformation for quick wins that yield revenue payoffs and reduce costs—gains that can then be reinvested. One

e-tailer, for example, unlocked \$300 million in just five months by prioritizing initiatives with the fastest payback. That turned into more than \$800 million within a year, thanks to momentum from the early windfall.

Effective sequencing requires clear criteria to evaluate the potential payoff of various parts of the transformation initiative. These should include a hard-nosed assessment of projected benefits, the time needed to capture them, dependencies, investments required, and impact on the overall transformation journey. Sequencing with an eye toward cumulative effect is also necessary, so the business builds toward a cohesive digital whole rather than a jumble of loosely affiliated programs, which can undermine the ultimate benefits of scale.



Digital is the defining challenge for today's generation of CEOs. And the decisions they make will determine whether their businesses thrive or fade. ♦

¹⁴“How to beat the transformation odds: McKinsey Global Survey results,” April 2015, McKinsey.com.

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EyeEm/Getty Images

From disrupted to disruptor: Reinventing your business by transforming the core

Peter Dahlström, Liz Ericson, Somesh Khanna, and Jürgen Meffert

Companies must be open to radical reinvention to find new, significant, and sustainable sources of revenue.

When Madonna burst onto the scene

in the early 1980s, there was little reason to suspect that she'd have more than her allotted 15 minutes of fame. But in the three decades since her debut album, she has become a media icon.

Her secret? Constant reinvention. Fittingly, the name of Madonna's sixth concert tour was "Reinvention."

Madonna may seem like an unlikely touchstone for modern businesses, but her ability to adapt to new trends and set some others offers a lesson for companies struggling with their own digital revolutions. That's because the digital age rewards change and punishes stasis. Companies must be open to radical reinvention to find new, significant, and sustainable sources of revenue.

Incremental adjustments or building something new outside the core business can provide real benefits; in many cases, this is a crucial first step for a digital transformation. But if these initiatives don't lead to more profound changes to the core business and avoid the real work of rearchitecting how the business makes money, the benefits can be fleeting and too insignificant to avert a steady march to oblivion.

Simply taking an existing product line and putting it on an e-commerce site or digitizing a customer experience is not a digital reinvention. Reinvention is a rethinking of the business itself. Companies need to ask fundamental questions, such as, "Are we a manufacturer, or are we a company that enables customers to perform tasks with our equipment wherever and whenever they need to?" If it's the latter, then logistics and service operations may suddenly become more important than the factory line. Netflix's evolution from a company that rented DVDs to a company that streams entertainment for a monthly subscription to one that now creates its own content is a well-known example of continuous reinvention.

Reinvention, as the term implies, requires a significant commitment. From our Digital Quotient research, we know that digital success requires not only that investment be aligned closely with strategy but also that it be at sufficient scale. Digital leaders have a high threshold for risk and are willing to make bold decisions.¹ But companies don't have to look far into the future to realize those

benefits. We've found that 60 to 80 percent of total improvement targets can be achieved within about three years while also laying the foundation for future growth.

For all the fundamental change that digital reinvention demands, it is worth emphasizing that it doesn't call for a "throw it all out" approach. An engine-parts company, for example, will likely still make engine parts after a digital reinvention but may do so in a way that's much more agile and analytically driven, or the company may open up new lines of business by leveraging existing assets. Apple, with its move from computer manufacturer to music and lifestyle brand through its iPhone and iTunes ecosystem, reinvented itself—even as it continued to build computers. John Deere created a whole series of online services for farmers even as it continued to sell tractors and farm equipment.

There are many elements to a transformation, from end-to-end journey redesign and embedding analytics into processes to open tech platforms. They require myriad capabilities, from artificial intelligence and agile operations to data lakes, cloud-based infrastructure, and new talent. Many of these elements have been written about extensively, and each can absorb a significant amount of executive time. What's often missing, however, is a comprehensive view of how an organization sets the right ambition, how to design and implement the right elements for the transformation, and then how to systematically and holistically undertake the change journey.

¹ Tanguy Caitlin, Jay Scanlan, and Paul Willmott, "Raising your Digital Quotient," *McKinsey Quarterly*, June 2015, McKinsey.com.

What the ‘core’ is and why it needs to change

“Think of your core muscles as the sturdy central link in a chain connecting your upper and lower body.”² That was the guidance from Harvard Medical School on how to stay in shape. The authors defined the core as the central set of muscles that helps a body maintain its power, balance, and overall health.

That’s the essence of what we mean when we talk about changing the core of the business—the set of capabilities that allows the entire business to run effectively. A company’s core is the value proposition of its business, grounded in strategy and enabled by its people, processes, and technology. These elements are so intrinsic that any transformation that doesn’t address them will ultimately fizzle because the legacy organization will inevitably exert a gravitational pull back to established practices.

Value proposition: Any digital reinvention must address the value the company provides to customers (whether existing or new) through its products and/or services. Inevitably this is based on a clear strategy that articulates where value is being created, shifted, or destroyed. Crucial to getting this right is identifying and evaluating existing assets that are most important and understanding what customers actually want or need. This can be surprisingly difficult to do in practice. The value that Amazon originally provided, for example, wasn’t selling books online but rather providing convenience

and unheard-of selection. Understanding the real source of its value allowed Amazon to expand exponentially beyond books.

People: Of course talent is important, but a reinvention needs to involve more than just hiring a CDO or a few designers. Talent priorities should be based on a clear understanding of the skills needed at all levels of the business. This requires investing in building relevant digital capabilities that fit with the strategy and keep pace with customers as they change the way they consider and make purchases. At the same time, targeted hiring should be tied to those capabilities that actually drive financial performance.³

Enabling that talent to thrive requires a digital culture—one that is customer-centric and project based, with a bias for speed and continuous learning. In fact, cultural and organizational issues can lead to the squandering of up to 85 percent of the value at stake.⁴ Making sure the new culture sticks requires rebuilding programs that reward and encourage new behaviors, such as performance management, promotion criteria, and incentive systems.

Processes: Rewiring the mechanisms for making decisions and getting things done is what enables the digital machine to run. Digitizing or automating supply chains and information-intensive processes as well as building new capabilities like robotic process automation or advanced analytics, for example,

² “The real-world benefits of strengthening your core,” *Harvard Health Publications*, Harvard Medical School, January 2012, health.harvard.edu.

³ For more on talent, see Tanguy Caitlin, Jay Scanlan, and Paul Willmott, “Raising your Digital Quotient,” *McKinsey Quarterly*, June 2015, McKinsey.com.

⁴ 2016 Digital McKinsey Survey.

can rapidly increase the business's clock speed and cut costs by up to 90 percent.⁵

One temptation is to focus on simply digitizing existing processes rather than really rethinking them. Often, the most productive way to tackle this issue is to identify the customer journeys that matter most to the business and then map out the touchpoints, processes, and capabilities required to deliver on them—without regard to what is already in place. Rearchitecting processes requires establishing governance and decision rights to provide clarity and accountability, as well as embedding

advanced analytics, automation, and machine-learning capabilities.⁶

Technology: While digital reinvention is more than just a technology overhaul, technology is crucial to it. Leaders need to ensure that each IT investment responds to clear and robust business needs and does not devolve into “tech for tech’s sake.” They also need to identify how best to work within an ecosystem of partners and vendors, and assess which legacy systems to keep, which to mothball, and—critically—determine how to help legacy technology work in a digital world.

⁵ Shahar Markovitch and Paul Willmott, “Accelerating the digitization of business processes,” May 2014, McKinsey.com.

⁶ Ibid.

EXHIBIT

Extracting value from digital requires the 'four Ds' of digital transformation.

Discover:

Shape digital ambition, strategy, and business case based on industry-level insights

Design:

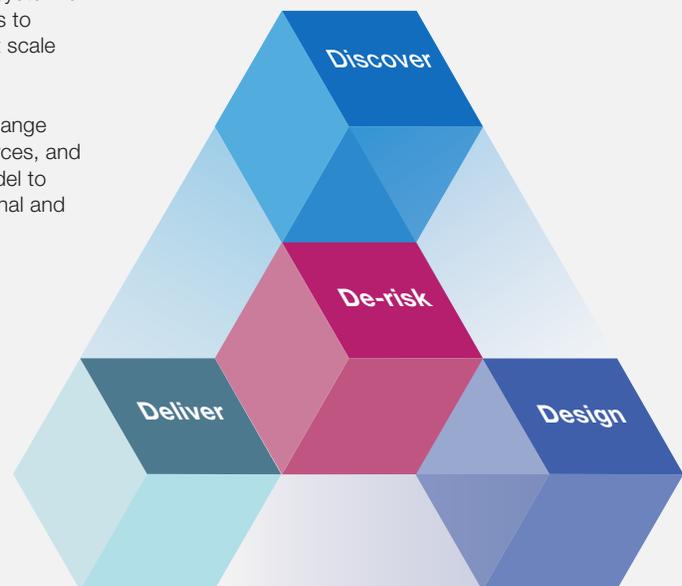
Reinvent and prototype new capabilities and breakthrough journeys as part of a program

Deliver:

Activate an ecosystem of external partners to rapidly deliver at scale

De-risk:

Structure the change program, resources, and commercial model to reduce operational and financial risk



Reinvention requires a proven, systematic approach

Because of the complexity involved, most reinventions fall short of their original goals. In our experience, extracting the full value from digital requires a carefully coordinated approach across four “Ds”: **discover** what your digital ambition is (based on where the value is); **design** programs that target profitable customer experience journeys; **deliver** the change through an ecosystem of partners; and **de-risk** the process by thoughtfully sequencing steps (exhibit).

While this approach may seem self-evident, we find that most companies fall short in the execution. There are myriad reasons for this, but the most common are that the business either underinvests in the capabilities needed or doesn’t drive the transformation program sufficiently across all four Ds. A company may invest tens of millions of dollars to “discover” great insights, for example, but if its “deliver” strategy is inadequate, those insights are for naught.

1. Discover: Shape your digital ambition, strategy, and business case

In this phase, companies develop a clear view of where value is being created and destroyed as the basis for a strong business strategy. That requires an analysis of their business, sector, customer-behavior trends, and the larger economy to identify and quantify both threats and opportunities. These kinds of digital-opportunity scans should be sorted by short- and long-term pockets of value.⁷

At the same time, companies need to engage in a sober analysis of their own digital capabilities and resources. Capabilities that

build foundations for other key processes and activities (for example, modular IT and agile technology platforms) are particularly important. And while leadership matters, our DQ research has shown that midlevel talent is the most critical element for a company’s digital success.

With this understanding in hand, companies then determine what their strategic ambition is, whether retooling the existing business or something more radical, such as plunging into a new market or innovating a business model. They develop a detailed road map for addressing capability gaps and recruiting, developing, incentivizing, and retaining the necessary talent. The goal is to develop a tight business case for change based on facts.

2. Design: Create and prototype breakthrough experiences

Actually acting on a digital ambition can be daunting. We have found that the most successful companies start by focusing on the most important customer journeys, then work back from there to design and build out breakthrough customer experiences. Using design thinking and skills, these companies define each journey, looking especially for the pain points and potential missed connections. The change team can then map out, screen by screen, models for a new interface. In this phase, the company must avoid getting caught in endless rounds of planning and instead rapidly build prototypes, translating concepts into minimum viable products to test and iterate in the market before scaling.

This phase also includes creating rapid-delivery approaches and an IT infrastructure that blends the legacy systems with

⁷ For more, see Angus Dawson, Martin Hirt, and Jay Scanlan, “The economic essentials of digital strategy,” *McKinsey Quarterly*, March 2016, McKinsey.com.

Digital reinvention will put new demands on leadership. Here are some crucial questions leaders should ask themselves:

- Where have our past transformations succeeded or broken down?
 - What do our customers say about their experience with our company?
 - Do we understand what the next sources of value are and are we ready for them?
 - Are we investing in the right places and at the right levels to reinvent ourselves?
-

microservices and modular plug-and-play elements. While agile IT has become standard, more digital businesses are embracing integrated development and operations teams, or DevOps, and continuous delivery so that software can be developed, tested, and deployed quickly to consumers and end users.

On the organization side, the fluid nature of cross-functional collaboration, rapid decision making, and iterative development means that the business should focus on the enablers for this kind of teamwork. These include effective metrics and scorecards to evaluate digital performance and incentive structures to drive the right behaviors, mind-sets, and outcomes. The CDO at one multinational pharmaceutical company addressed this issue by establishing a “digital council,” which was tasked with breaking down organizational silos to enable transformational change across all business lines. The initiative was credited with significantly contributing to a 12 percent increase in sales.

3. Deliver: Develop a network of partners who can rapidly scale your ambition

Getting the speed and scale necessary for a reinvention increasingly requires an ecosystem of external teams, partners, suppliers, and customers. In practice, this means working with a mix of platform players, delivery specialists, and niche players. These are the relationships that companies can call on to provide specific skills and capabilities quickly.

This reality has made ecosystem management an important competency, especially understanding how to find and plug into the right mix of complementary capabilities. One national bookseller, for example, built out a digital offer by partnering with a telecom company for its technology and with a range of retailers to build up a marketplace. This approach allowed it to rapidly hit the marketplace and increase revenue 78 percent in a year.

As companies push to scale their digital reinvention throughout the organization, the

crucial role of seasoned change managers comes into focus. These leaders not only play “air-traffic controller” to the many moving parts, but also have the business credibility and skill to solve real business problems. They must maintain an accelerated pace of change and drive accountability across the business. The change leaders will look across the entire enterprise, examining organizational structure, data governance, talent recruitment, performance management, and IT systems for areas of opportunity, making decisions that balance efficiency and speed with outcome.

The “agility coach” is an example of this type of role. This person has strong communications and influencing skills, can create and roll out plans to support agile processes across the business, and can put in place key performance indicators and metrics to track progress.

4. De-risk: Structuring the process to minimize risk

One of the most common reasons digital transformations fail is that the organization develops “change exhaustion,” and funds start to dry up. To mitigate this risk, it’s important to focus on quick wins that not only build momentum but also generate cost savings that can be reinvested in the next round of transformations. One global e-tailer, for example, focused on quick wins (such as increasing conversion rates) and was able to deliver \$350 million in new revenue in just five months, which funded further changes and provided tangible results to further excite the business about the journey. This sequencing approach applies to tech as well. Many companies choose to invest first in “horizontal” components, such as business-process management layers or central

administration platforms that can be shared across many initiatives, while balancing them with more “visible” elements to provide the proof of concept.

Technology risks, especially cybersecurity, will also require increased attention as companies digitize more operations and processes. Organizations can mitigate these risks by automating tests on software, establishing systems in which failures can be rolled back in minutes, and establishing build environments in which fixes can be made without putting significant parts of the business at risk. Senior leaders in particular need to focus on the structural and organizational issues—from building cybersecurity into all business functions to changing user behavior—that hamper the ability to manage cyber risk.

One risk senior leaders often overlook is losing ownership over sources of value. These might include the company’s data, customer relationships, or other assets. Having a clear understanding of where the value is coming from allows businesses to navigate ecosystem relationships profitably. For example, in evaluating which partners to work with, the bookseller mentioned earlier declined to work with a storefront partner because it feared losing its most valuable asset: its direct relationship with its customers.



Companies can both rise and fall with astonishing speed as new customer needs are uncovered and new ways of meeting them are developed. We strongly believe that companies that are able to adapt, learn, and find new solutions quickly can do more than

just retain market position; they can thrive, whatever disruptions come their way. As

Madonna once said: “You have to reinvent to stay in the game.” ♦

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Adopting an ecosystem view of business technology

Driek Desmet, Niels Maerkedahl, and Parker Shi

To fully benefit from new business technology, CIOs need to adapt their traditional IT functions to the opportunities and challenges of emerging technology ecosystems. Here's how it's done.

IT has traditionally functioned as the foundation to keep a company running. One of its core functions has been to protect company operations with firewalls and encryption to keep external technologies out. With the advance of technologies, however, a vast array of capabilities and sources of competitive advantage are emerging beyond a business' traditional walls. Those capabilities are coalescing in a wealth of new ecosystems (Exhibit 1).

These ecosystems often overlap. A social payment app, for example, may be part of the

mobile, social, data, and banking-services ecosystems. The Internet of Things (IoT) is an ecosystem where multiple applications communicate with one another as a network.

By plugging into these ecosystems, companies can get access to entire networks. They can, among other benefits, find new customers, tap into new sources of data, and improve established business processes.

CIOs and IT organizations have a huge role to play in capturing these opportunities. But they

EXHIBIT 1 Ecosystem archetypes demonstrate explosive growth.

	Objectives	Examples
Sales	<ul style="list-style-type: none"> • Allow users to interact with one another socially • Primary angle is to attract as many customers and social interactions as possible 	<ul style="list-style-type: none"> • Individual social platforms such as Facebook, Instagram, Line, Tencent Wechat, Twitter • Professional social platforms such as LinkedIn
Data	<ul style="list-style-type: none"> • Sharing data using standard data definitions • Providing additional data- and analytics-based services • Primary focus is to capture and use external and proprietary data 	<ul style="list-style-type: none"> • Internet of Things efforts by Caterpillar, GE Aviation, John Deere, Minestar • Apple iHealth • Property-and-casualty insurers (eg, using weather-data patterns to assess fire risks)
Technology	<ul style="list-style-type: none"> • Enablement by industry-standard software and hardware • Better/faster IT delivery through broad range of specialist IT firms and technologies 	<ul style="list-style-type: none"> • Consumer mobile such as Apple iOS and Google Android • Enterprise-technology platforms such as Microsoft Office, Oracle ERP, SAP ERP, SAP Hans • Visa/MasterCard’s payment-processing platforms, and blockchain
Customer journeys	<ul style="list-style-type: none"> • Leverage company’s core commerce functionality and value proposition to attract large number of customers • Additional capabilities to complete the customer journey and experience can then be added to create network effect 	<ul style="list-style-type: none"> • Ridesharing platforms such as Uber and Lyft • Shopping platforms such as Amazon • Travel platforms such as Airbnb • Banks allying with fintech players in value chain, eg, SME¹ app players linked via APIs into bank
Services	<ul style="list-style-type: none"> • Integrate multiple companies’ services to holistically address customers’ pain points and make the initial product/services more attractive for customers • Bundling can be done either transparently or explicitly 	<ul style="list-style-type: none"> • Transparent add-ons such as Amazon Alexa and Slack • Explicit services platform such as Salesforce.com and the salesforce ecosystem/AppExchange

¹Small and medium-size enterprise.

Source: McKinsey analysis

can’t do it through “business as usual.” In an ecosystem environment, an exclusive focus on “protecting the center” can limit a company’s ability to capitalize on emerging opportunities. To adapt their complex business-technology architecture to function in a world of eco-systems, CIOs will have to figure out how to simultaneously draw external technologies

closer while managing security issues and getting a handle on the accelerating stream of technological innovations.

IDC predicts that by 2018, more than 50 percent of large enterprises—and more than 80 percent of enterprises with advanced digital-transformation strategies—will create

or partner with industry platforms.¹ At the same time, there will be more than 50 billion connected devices by 2020, according to Cisco.

technologies (ET). For the CIO, this shift also creates a significant opportunity to work closely with the CEO on business priorities and to become a prime strategic partner.

These numbers point toward a radical reframing of what IT is and how CIOs manage it—not as an internal collection of information technologies (IT) but as a broad network of ecosystem

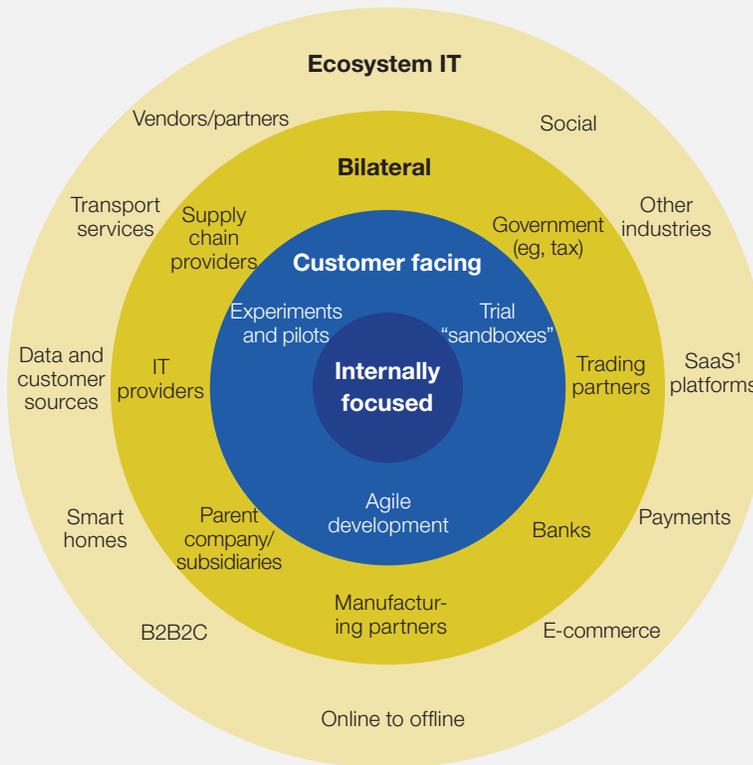
Understanding ecosystem technologies

ET encapsulates an expanded set of IT capabilities and functions (Exhibit 2). The CIO still needs to manage the multispeed IT functions²

¹ “IDC predicts the emergence of ‘the DX economy’ in a critical period of widespread digital transformation and massive scale up of 3rd platform technologies in every industry,” November 4, 2015, idc.com.

² Oliver Bossert, Chris Ip, and Jürgen Laartz, “A two-speed IT architecture for the digital enterprise,” December 2014, McKinsey.com.

EXHIBIT 2 Ecosystem technologies have four layers of IT.



¹Software as a service.

Source: McKinsey analysis

as well as current bilateral programs. The new layer of ET represents a new set of capabilities as well as the extension of existing ones.

CIOs can define and shape their ET in three ways:

1. Opening up internal IT to outside world

This approach is about architecting IT to link internally driven systems and capabilities into external systems. One example of this in action is Delta Air Lines' mobile app, which extends to Uber so travelers can order a car upon landing. Kraft has expanded its recipe app to become a pantry-management tool, generating a shopping list that seamlessly connects with the grocery-delivery service Peapod. Think of it as extending the customer's journey—and the company's relationship with the customer—through integration with other service providers.³

Many companies have already been providing integration capabilities to upstream and downstream partners—technologies such as electronic data interchange have been in existence for decades. However, those integration points are often static. They are bilateral connections with a small, preselected group of partners such as distributors and suppliers. Those points of integration happen infrequently and often in a batch.

The future of integration into external ecosystems will force companies to interact with many more partners covering a broad range of functions, ranging from customer sourcing to social advertising to payment solutions. That's because the low cost of technology and a dynamic start-up environment has led to a massive increase in the rate at which new services are being introduced. This means

that the IT function must follow the “Amazon principle” of making system components available as a service to enable integration with the ecosystem. The interfaces must be open, dynamic, and functional in real time so that they can integrate partners, technologies, and applications on an as-needed basis.

One clear implication is the need to design lightweight technology architecture built on microservices and APIs to allow third parties to easily hook into the new ecosystem. CIOs need to start thinking in terms of platform architecture such as auto-industry OEMs use to allow for future upgrades across the ecosystem. They may even need to offer an ‘app store’ to allow consumers to pick and choose desired capabilities—and, of course, the infrastructure must be robust and secure.

One example of how this can play out might be found in telecom players that expand their connected services to e-commerce, music, health, insurance, education, media, and smart homes. These services would all be connected into one ecosystem offering the customer multiple services through the telco's technology backbone. Salesforce.com's AppExchange is already doing this by creating an environment in the cloud where developers can create and release their own apps.

2. Internalizing external IT

This approach focuses on opening up internal IT systems so that the business can plug in the external capabilities available in the ecosystem to better serve its own customers, support its own employees, or create new products and capabilities, often offered via software as a service and APIs. A simple

³ Examples from David C. Edelman and Marc Singer, “Competing on customer journeys,” *Harvard Business Review*, November 2015, hbr.org.

example is integrating a third-party point-of-sale application into a company's internal payment systems to simplify a customer's in-store purchase process. Or integrating a third-party customer-service chat function into a company's website. Or even integrating Yammer to help with employee productivity.

This approach clearly changes how IT designs and manages its systems. It's no longer about buying software packages and building bespoke solutions on premise or working with a few systems integrators to deliver a business solution. It's now all about understanding the end-to-end customer experience and how external and already available services can be utilized with internal solutions to offer a complete and unique offering. Companies will need to complement internal skills with external specialization integrated deeply into the ongoing fabric of its IT application development and infrastructure management. It's about creating a 24/7 environment that enables product offerings to millions of customers globally.

One leading international travel company, disrupted by start-ups in the market, decided it needed to build up its capabilities to drive its transformation. An important component of its strategy was to use specialized vendors from the external ecosystem to support different capabilities, for example, mobile, search engine, customer relationship management, and payments. This approach allowed them to accelerate their transformation, scale up their services, and tap specialized talent as technologies evolved and demand spiked.

3. Modernizing IT to scale innovation

We've all heard often enough how torrid the pace of new technologies has become. But it's worth remembering that many of the new tools have the potential to fundamentally change a company's business model. That may not be

clear at first. To guard against being caught unprepared and to adopt a more aggressive competitive posture, companies should begin testing these technologies to be ready to bring them on board as soon as their value is proven and they can work at scale. This may be a matter of "playing" with new technology (for example, open-source standards) in dedicated sandlots where the connectivity between the internal IT and external IT can be tested. Furthermore IT leaders will need to actively form partnerships or alliances with vendors and service providers to really understand and evaluate how the technology can be used in their business environment.

It is true that many companies have already been actively investing in emerging technologies. For example, many financial-services companies have set up internal corporate venture-capital funds to invest in technologies such as blockchain and the IoT. However, companies have demonstrated less progress—and success—in integrating those technologies into their existing IT infrastructure and successfully extending the value proposition to their customers. The start-ups often have immature technologies that cannot scale, and they often leverage external cloud services that may not be compatible with companies' own cloud infrastructure. Therefore it's important for companies to think through how they enable a smooth integration of both technical solution and working culture to fully capitalize on the products that the start-ups are offering. If not done correctly, companies will create the next wave of spaghetti IT infrastructure.

Given the scale of innovation, it would be virtually impossible to keep up unless the CIO designates specific analysts or architects whose job it is to identify and assess the compatibility of external technologies. The DBS Innovation Group, for example, has

Questions the CEO can ask the CIO

- Have you identified the set of technologies, platforms, and vendors that can help us accelerate our digital strategy?
 - How quickly can a potential partner integrate our services into their services?
 - How quickly can we add a new vendor/partner today to accelerate a specific capability such as live-data connectivity?
 - What are the three most important sources of value that the external ecosystem can provide?
 - What talent and capabilities have you identified that we need to succeed in the ecosystem? How are you building them?
 - Do our cybersecurity policies and practices cover external partners? And their partners?
 - How are we ensuring that our services are exposed to and can interact with the broader ecosystem?
-

established a fintech senior-vice-president role responsible for identifying, integrating, and managing potential ecosystem members. This person leads and drives fintech engagements locally and regionally, and reports to the global head of partnerships.

Regardless of which way—or combination of ways—the CEO and CIO choose, IT moves to the forefront not just of technology but also of business-model innovation.

Getting started with ET

While building out ET is complex and based on many interdependencies, we've found that focusing on the following six elements gives CIOs and CEOs a big advantage in getting the most value from it:

1. Rethink business strategy. Which way, or combination of ways, a company chooses to interact with various ecosystems (or create its own ecosystem) depends on three things: its strategy, the market environment, and the risk appetite of the overall enterprise. This in turn requires the CIO to work closely as a partner with the CEO and C-suite to help shape the business strategy by identifying emerging technologies and ecosystems that could disrupt the marketplace, determine where future sources of value are, and develop necessary strategic actions to capture it. This dialog is a two-way and constant exploration in which technology and business strategy are inextricably linked. The CIO's role is not just to determine feasibility but to help the business determine what threats and opportunities exist in engaging in ecosystems.⁴

⁴ For more, see Angus Dawson, Martin Hirt, and Jay Scanlan, "The economic essentials of digital strategy," *McKinsey Quarterly*, March 2016, McKinsey.com.

2. Develop the infrastructure. The new bidirectional integration of technologies is dynamic in nature; it happens in real time with thousands of invoking partners or end consumers. This requires companies to redesign the next-generation integration architecture to support it and enforce open standards that can be easily adopted by external parties. A company's existing master data-management catalog will also need to be extended to include third-party data and potential integration with external master-data providers. There has to be a clear data architecture and governance in place to ensure data cleaning, rationalization, and standardization for the systems to work.

3. Reinvent customer-management processes and structures. When customers call with technical issues, it will be challenging to figure where the fault points are in an ET environment. Is it the company's systems, a third party's services, the cloud that houses the service, the network—or some combination of the above? This reality will require companies to fundamentally rethink their infrastructure-support processes.

Creating service-level agreements that clearly define issue resolution and escalation protocols that all parties agree to will be crucial. Creating standard identifying tags or “tripwires” and integrating them into participating ET services, partners, and technologies will be important to locate issues quickly so they can be resolved.

These standards and agreements, however, are not an excuse for shuttling customers from one partner to another. The customer-facing company needs to solve the issues behind the scenes and spare the customer the complexity of navigating the partners' ecosystems.

4. Define the parameters for cybersecurity, legal, and partnerships. As a result of the extended infrastructure, internal cybersecurity policies and processes will need to include third-party partners and vendors. A new set of security standards should be defined and agreed to that clearly articulates how the integration will take place and what kind of data can be exchanged with whom.

Working with a broad range of third parties will raise other legal questions as well. Intellectual property, liability, privacy, profit sharing, and regulatory/compliance issues all have the potential to severely impede potential benefits from engaging in the broader ecosystem. Licensing issues have already emerged between cloud companies and on-premises hardware and software businesses because of competing and different business models. Data ownership and customer management in particular will be crucial given the need for companies to access both.

This will call on significant negotiating skills and a commitment to develop and apply a broad set of standards to avoid constant renegotiating with each new partner or vendor from scratch. Setting up an app-store approach where standards are clearly stated, tools are provided, and agreements are made at the beginning may provide a useful model.

Engaging with a network of vendors also requires changes in skills certification and vendor-performance management. Companies will need to clearly define the standards and procedures under which vendors must operate and guidelines that define how the vendor will be included in the delivery life cycle. Home Depot is developing standards with the manufacturers of its products to ensure compatibility with the Wink connected-home system. Companies that

do this most effectively treat vendor relationships as partnerships with strong transparency. The internal-supply and vendor-management functions will need to be restructured to work more like M&A, which can integrate new partners or establish new alliances quickly and efficiently.

5. Cultivate an ‘open’ mind. CIOs have traditionally focused on protecting systems and ensuring that they run well. But the new digital world demands more active engagement with the outside world to understand competitive threats and sources of value. CIOs should start with developing a much more externally compatible view of the current IT infrastructure and thinking about how to design new ways of meaningfully integrating external systems. Spending a long time building overly complex “bulletproof” systems is counterproductive; testing an application or new platform environment should take a matter of days or weeks.

6. Invest in new capabilities. As businesses increasingly engage with external ecosystem technologies, full-stack architects and convergence infrastructure engineers are needed who can provide expertise in third-party packaged software, have fluency in multiple best-of-breed technologies, and bring experience integrating multiple technologies. “Translator” capabilities will also be crucial to bridge the gaps between business goals and technology requirements to be provisioned through the ecosystem. Any new function within

the enterprise architecture should work closely with business to understand how external services can be integrated with products to extend the customer value proposition.

With the advancement of cloud computing and infrastructure as programmable software, infrastructure resources (for example, networks, servers, storage, applications, and services) can now be quickly provisioned, managed, and operated with minimal effort. This requires the integration of development and operations, or DevOps; cloud engineers, who have the experience to navigate a rapidly changing cloud-computing ecosystem and program software; and data scientists, automation engineers, and enterprise architects. Companies will also need to find a few senior developers who can set up app-store development standards.

Companies have outsourced many of these capabilities. But due to the increased importance of engineering and automation skills, many are rethinking that approach as IT evolves from utility to enabler.



Integrating a company’s IT with third-party capabilities creates opportunities to capture substantial new sources of value. But until IT expands to become ET, the vast majority of those opportunities will remain out of reach. ♦

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Using blockchain to improve data management in the public sector

Steve Cheng, Matthias Daub, Axel Domeyer, and Martin Lundqvist

It's not just for financial institutions; government agencies can use this digital ledger technology to protect trusted records and simplify interactions with citizens.

An important function of government is to maintain trusted information about individuals, organizations, assets, and activities. Local, regional, and national agencies are charged with maintaining records that include, for instance, birth and death dates or information about marital status, business licensing, property transfers, or criminal activity. Managing and using these data can be complicated, even for advanced governments. Some records exist only in paper form, and if changes need to be made in official registries, citizens often must appear in person to do so.

Individual agencies tend to build their own silos of data and information-management protocols, which preclude other parts of the government from using them. And, of course, these data must be protected against unauthorized access or manipulation, with no room for error.

Blockchain technology could simplify the management of trusted information, making it easier for government agencies to access and use critical public-sector data while maintaining the security of this information. A blockchain is an encoded digital ledger that

is stored on multiple computers in a public or private network. It comprises data records, or “blocks.” Once these blocks are collected in a chain, they cannot be changed or deleted by a single actor; instead, they are verified and managed using automation and shared governance protocols. (See sidebar “Capturing value from blockchain technology.”)

So far, banks, payment-service providers, and insurance companies have shown the highest level of interest and investment in blockchain.¹

But we believe government agencies have just as much to gain from experimenting with this technology and deploying it strategically through pilot projects. Over time, blockchain can help agencies digitize existing records and manage them within a secure infrastructure, allowing agencies to make some of these records “smart.” IT departments in government agencies may be able to create rules and algorithms, for instance, that allow data in a blockchain to be automatically shared with third parties once predefined conditions are

¹ For more, see *Blockchain in insurance—opportunity or threat?*, July 2016, McKinsey.com; and *Beyond the hype: Blockchains in capital markets*, December 2015, McKinsey.com.

Capturing value from blockchain technology

The core innovation of blockchain is that it allows for decentralized verification of any information added to an encoded digital ledger. The ledger extends across a network of computers and servers. There is no central agent that decides if a change to the blockchain is legitimate. Instead, all the computers in the network follow a protocol to independently verify transactions and generate automated consensus on the acceptance or rejection of a change.

This verification process, along with modern encryption methods, can effectively secure the data on blockchain ledgers against unauthorized access or manipulation. Because the existing “blocks” in the chain can never be overwritten, users always have access to a comprehensive audit trail of activity. Additionally, decentralized storage of information reduces the risk that users will not be able to get the data they need when they need it—there is no single point of failure.

Of particular interest to public-sector agencies, the use of blockchain may result in the following:

Tamperproof records. Users of a blockchain database could easily reconstruct when a change to the ledger occurred, what information was modified, and where in the network the change originated.

Digital ownership and transfer of assets. Agencies could forego paper documents and set up an efficient digital infrastructure to record asset ownership and provide the means to easily transfer information about bills of sale, deeds, and the like.

Smart contracts. Blockchain ledgers can also store contracts in software code, so when predefined external conditions are met, online transactions can kick in. The high level of security afforded through blockchain allows the contracting parties to trust a decentralized execution engine to implement the terms of agreement

met. In the longer term, the technology may even allow individuals and organizations to gain direct control over all the information the government keeps about them. This level of transparency could, in turn, make it easier for agencies to achieve buy-in for the creation of networked public services.²

Finding advantages in blockchain

There are a number of blockchain tools and technologies that government agencies can implement today to protect critical data and improve the management of records associated with property ownership and incorporation. In the long term, as blockchain matures, governments may also use it to enable networked public services.

Managing data and digital assets

Protection of critical data. Anyone who uses public services is rightly worried that, despite agencies' best efforts to protect their systems, criminals might gain access to government databases and steal or manipulate records. In 2015, for instance, hackers obtained personal details, Social Security numbers, fingerprints, employment history, and financial information for about 20 million individuals who had been subject to a background check by the US government. Encryption methods can never be 100 percent safe, but blockchain technology can make similar breaches a great deal more difficult to achieve.

The nation of Estonia, for example, is rolling out a technology called Keyless Signature Infrastructure (KSI) to safeguard all public-sector data. KSI creates hash values, which uniquely represent large amounts of data as much smaller numeric values. The hash values can be used to identify records but

cannot be used to reconstruct the information in the file itself. The hash values are stored in a blockchain and distributed across a private network of government computers. Whenever an underlying file changes, a new hash value is appended to the chain, and this information can no longer be changed. The history of each record is fully transparent, and unauthorized tampering from within or without the system can be detected and prevented. KSI allows government officials to monitor changes within various databases—who changes a record, what changes are implemented, and when they are made. The electronic health records of all Estonian citizens are managed using KSI technology, and the country is planning to make KSI available to all government agencies and private-sector companies in the country.

Digital property ownership. The process of owning and transferring assets—whether physical property or financial instruments—typically involves multiple interactions and a long paper trail. Government agencies could meaningfully cut down on both by digitizing information about asset ownership and storing it on blockchain registers. Consider the emerging use of blockchain technology by the Swedish government. When it comes to real-estate transactions in Sweden, the stakes are high. The cumulative value of all properties in the country is currently more than 11 trillion Swedish Krona, or roughly three times the value of Sweden's GDP. Yet the registration and transfer of properties remain onerous tasks. The country's land-registry authority, Lantmäteriet, is exploring ways to digitize the process. It is prototyping a mobile app that would provide transaction space for sellers and buyers as well as their real-estate agents and banks. A blockchain would record detailed information on the properties being

² This article focuses on the use of blockchain to improve records management. Governments might also use the technology to implement digital currencies and payments.

sold as well as each step in the sales transaction. Communications among all the parties in the sale would become more transparent. Paper documentation—typically hundreds of pages long—would become superfluous. When implemented, the app is expected to reduce the time needed to complete a sale from three-to-six months to just a few days, in some cases even hours. (See sidebar “Toward faster real-estate transactions in Sweden.”)

The republic of Georgia has indicated that it will test a similar technology, allowing citizens and companies to use a smartphone application

to acquire and transfer property titles within a short period of time and at limited cost. The current property-transfer process is manual; applicants can spend up to a day waiting in line at a public registry and pay between \$50 and \$200 to complete a transaction. According to our analysis of real-estate transactions across all countries in the Organisation for Economic Co-operation and Development, buyers pay at least \$3.5 billion a year in administrative fees to register their purchases. Digital processing could significantly decrease the cost of this service to governments; in turn, agencies could pass the savings on to citizens.

Toward faster real-estate transactions in Sweden

The Swedish government is piloting a blockchain database intended to significantly streamline real-estate transactions. The database would allow for trusted digital verification of purchasing contracts, bills of sale, mortgage deeds, and other critical documents. It could also shorten the time between the writing of a purchase contract and the final registration of the asset transfer from months to days, and, in some cases, hours, while also reducing the risk of errors and fraud.

Lantmäteriet, the Swedish land-registry authority, plans to provide a mobile app that all parties to a real-estate transaction can use to exchange information, sign legally binding documents, and perform necessary property checks—all organized into a work flow that can be completed quickly. The application would communicate with blockchain-enabled databases on the back end of the land-registry authority’s IT architectures. The digital ledger would record each step of a real-estate transaction as well as the property titles themselves. Bank representatives and real-estate agents would have direct access to Lantmäteriet systems; and secure information would always be up to date and just a click away. This would help reduce processing time and legwork.

Because contracts and other critical documents would be rendered in digital form and signed digitally, there would be no need to create multiple paper copies, mail them, and then wait for signatures and responses. Everyone involved could retain a copy of the purchase agreement on their mobile phones; each copy would have a verification code registered in the blockchain. Since digital signatures would be provided with the same application at several instances, the risk of errors and fraud would be reduced. And Lantmäteriet would be involved in the purchase process throughout, rather than intermittently or at end stages—which could create greater confidence and transparency.

An additional benefit of using blockchain to keep track of property ownership is that insiders, too, could be held in check; it would be that much harder for unauthorized government employees to manipulate information. This could lead to more secure property rights in parts of the world where the rule of law is weak and abuse of power is high.

Smart incorporation. The US state of Delaware is in the early stages of creating incorporation services based on blockchain records and smart contracts, rather than paper-based exchanges. The process of incorporation, of course, involves filing the appropriate documents, establishing a separate legal entity, holding organizational meetings, issuing shares, adopting bylaws, and so on. A digital approach to incorporation would benefit, in particular, the growing number of private companies with complicated equity structures, where different shareholders have different rights and obligations. The rules associated with particular investments in a business could be formulated as smart contracts embedded in a blockchain. This blockchain might then be used to automate voting procedures or ensure compliance with rules regarding when and how investors can sell their shares.

Building networked public services

Governments normally know a lot about individuals and organizations because of all the data they collect. Because this information exists in agency and department silos, however, it is often not used to the fullest possible extent. Agencies that provide social services typically have little or no direct access to information about interactions that a client may have had with other public

authorities. And collecting such information can be a painstaking effort, requiring lots of time and legwork. In one Scandinavian country, for instance, civil servants who are responsible for planning rehabilitation programs for convicted criminals spend more than half of their workdays trying to get information about these individuals from different government agencies.

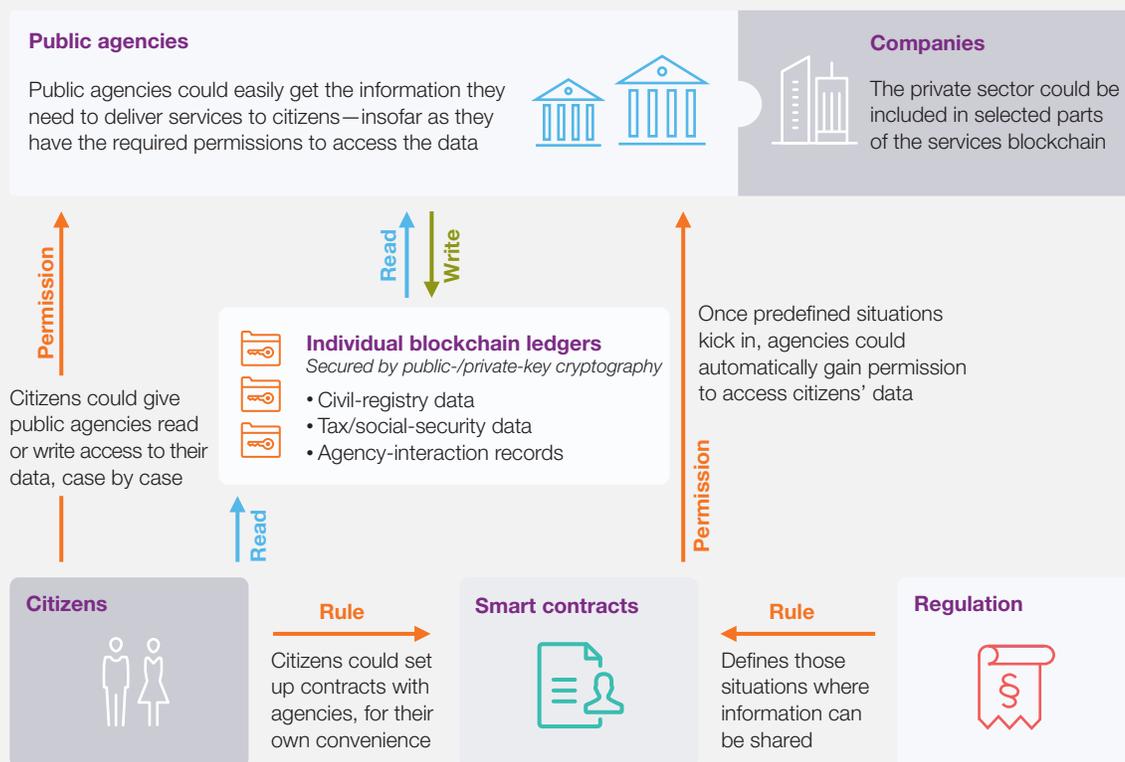
From a technical perspective, there is no good reason for keeping data in silos. With some effort, many governments could create central repositories or enterprise systems for sharing information across agencies. A critical sticking point, however, is security—like their counterparts in the private sector, public agencies cannot, under any circumstances, make sensitive data accessible indiscriminately. What's required is an environment in which data can easily be shared across systems but in which individuals and organizations can take back ownership of their data and control the flow of personal information—who sees it, what they see, and when.

Emerging blockchain technology may support such a scenario (exhibit). Each person or organization would have all relevant data about them (basic personal information, for instance, or records of previous interactions with government agencies) stored in a dedicated ledger within an encrypted blockchain database. Individuals or companies could access these ledgers through the Internet. End users could then give government agencies the authority to read or change specific elements of their individual ledger using public- and private-key cryptography.³ They could use public keys to selectively share

³ Public- and private-key cryptography systems use pairs of keys to authenticate and encrypt information that travels between two parties.

EXHIBIT

Individual blockchain ledgers could let public agencies deliver networked services and citizens control their own data.



Source: McKinsey analysis

information relating to a particular service transaction with agencies. Or they could issue private keys to agencies for one-time “write” access to their data.

In certain situations, smart contracts could expose certain information to designated agencies if predefined conditions are met. If recipients of unemployment benefits are imprisoned, for instance, that information could be transmitted to the labor agency so payments can be stopped for the duration of the sentence. Agencies would be able to

use a specific piece of information for the purpose at hand but would not have unlimited access to all of an end user’s data.

The use of blockchain ledgers would reduce the risk of unauthorized access (through strong encryption) and data manipulation (through tamperproof audit trails). Indeed, public services could become truly networked, without infringing unduly on privacy rights. Individuals and companies would no longer need to spend a lot of time filling in forms with information they had already provided to the

government. And agencies could tailor their services to meet individuals' needs, rather than deploying a one-size-fits-all approach.

Understanding and addressing risks and challenges

Government IT departments that want to adopt blockchain solutions must deal with an industry that is evolving quickly. Venture-capital funds have invested more than \$1.2 billion into blockchain start-ups over the past two years alone; about 50 of those start-ups have received more than \$1 million each.⁴

Such fast growth presents challenges for IT decision makers in government. First, there are no widely accepted standards for blockchain technologies or the networks that operate them. Government IT organizations—like everyone else—may therefore have a hard time assessing the quality of available solutions and determining how best to integrate them within their existing IT landscapes. Second, because many blockchain providers are small start-ups, it may be difficult for IT and procurement departments to identify partners with staying power—that is, companies that can offer cutting-edge products but are stable enough to see projects through to implementation.

At the same time, privacy risks will require constant attention. Even if governments could deploy blockchains that share data across public networks (as in the networked-services scenario described earlier), they would still need to ensure that current and future encryption methods are strong enough to ensure user privacy. Leaders in government agencies will need to understand the legal and regulatory implications of blockchain, among

them: To what degree will smart contracts be binding? Can blockchain audit trails be used as evidence in court? Should the use of blockchain be mandatory in certain fields?

How can governments take advantage of the rapid pace of innovation in the blockchain ecosystem, while dealing with these risks and challenges? One way is by adopting an incubator approach to change. That is, they can establish a small team that scans and prioritizes opportunities for blockchain pilots and then selects the right partners for implementation. This group could be within a government's central digitization office or within the individual authorities that stand to benefit most from blockchain deployment.

An incubator team at the monetary authority of Singapore, for instance, invited scores of blockchain start-ups to present their offerings and capabilities; a handful of these applications were then selected for pilot testing—among them, a payment infrastructure based on blockchain technology that would allow immigrants to send remittances home more quickly and at a lower cost. Lessons from pilot projects can help government agencies address standardization, security, and regulatory issues.

Scan

The incubator team could begin by reviewing ideas for the use of blockchain technology in public administration. The team's scan could focus on processes that, with improvement, could result in a better citizen experience—for instance, streamlining interactions that involve too many manual tasks, cost too much, or take too much time.

⁴ *Blockchain: Putting theory into practice*, Goldman Sachs Global Investment Research, May 2016; McKinsey's Panorama FinTech database.

Prioritize

The incubator team should investigate the incremental benefits that the use of blockchain technology might provide in each potential area of application. Using blockchain to record votes in an election, for instance, might be more tamperproof than existing digital and traditional voting methods. However, the incremental benefit of switching may not always be big. The team's focus should be on applications that can yield immediate, meaningful results that may prompt more buy-in for blockchain.

Partner

Once priorities have been set, the incubator team can explore partnerships with blockchain providers to create pilot programs. Through these relationships, technology companies have an opportunity to showcase and road-test products while public agencies accelerate their learning about blockchain without having to significantly add internal resources.

Once pilot programs are in place, governments should think about how to build on them. A national road map, for instance, could provide clear guidance to public agencies and blockchain-technology providers alike, about

technical standards and interoperability norms. It could include best practices for building capabilities across government agencies and funding the rollout of those blockchain applications that have shown potential in pilot phases. Governments could extend these conversations to include international partners—for instance, setting up a forum like the financial industry's R3 consortium to share lessons from pilot studies, exchange technical templates, or promote global technical standards.



Blockchain technology shows promise for those government bodies that are looking for better ways to manage and protect trusted information. It offers an enticing path toward more efficient operations, more responsive service, and enhanced data security. As early adopters in financial-service industries can attest, however, it will take time for the technology to fully mature. Now is the time for experimentation. By including blockchain in their innovation agendas—establishing it as a critical component of enterprise architecture—governments will learn what works in practice and how to unlock the full potential of data-driven service. ♦

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A future for mobile operators: The keys to successful reinvention

Guido Frisiani, Jay Jubas, Tomás Lajous, and Philipp Nattermann

By transforming their networks and operations with the newest technologies, mobile operators could double their cash-flow conversion within five years.

The past several years have been tough for telecom companies. Their revenue and cash flows¹ have dropped by an average of 6 percent a year since 2010. Consumption of mobile data has boomed as masses of new wireless customers use their handsets to spend ever-increasing amounts of time online. Companies have responded by investing heavily in their wireless networks, even as subscriber growth has slowed. As a result, the average ratio of capital spending to revenues

has remained stubbornly high, at around 15 percent, for the major players (Exhibit 1).

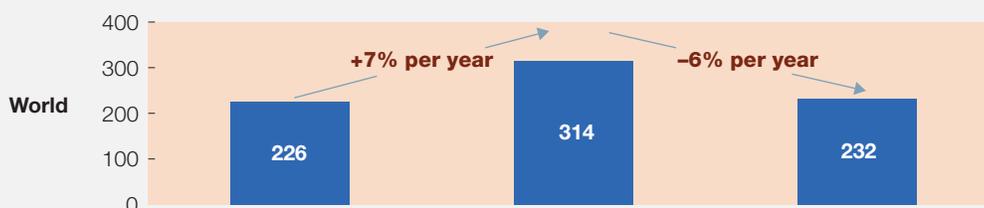
What can companies do to alleviate the squeeze on margins and create more value? Major advances in data analytics, artificial intelligence, network equipment, and other technologies have rewritten the industry's winning formula. With the newest software and hardware, along with digital-age management practices, mobile operators can achieve

¹ Cash flow is measured here in earnings before interest, taxes, depreciation, and amortization minus capital expenditures.

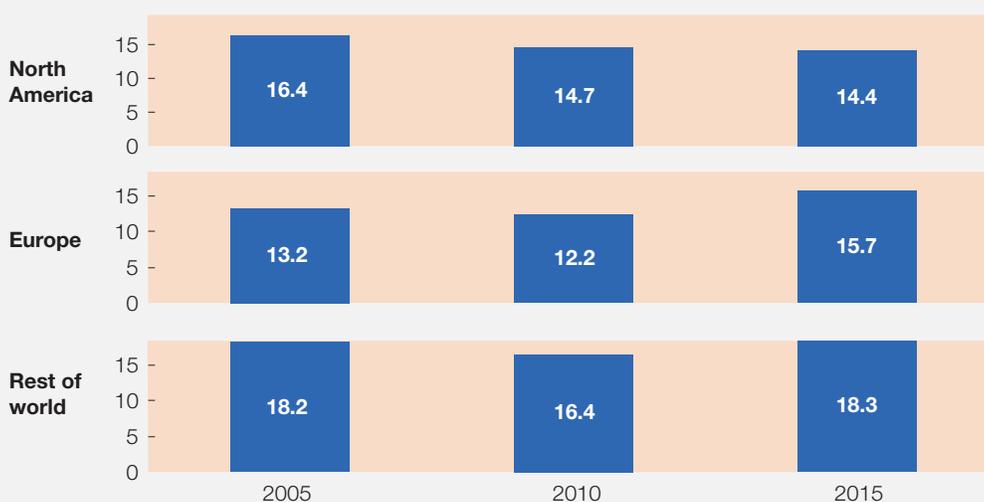
EXHIBIT 1

The cash flows of telecom companies dropped steadily from 2010 to 2015, and their capital expenditures hovered at around 15 percent of revenues for a decade.

Global industry cash flows (EBITDA – capital expenditures),¹ \$ billion



Capital-expenditure/revenue ratios for top telecom companies,² %



¹Largest 250 telecommunications companies; EBITDA = earnings before interest, taxes, depreciation, and amortization.

²Largest 6–7 companies in each region.

Source: S&P Capital IQ; McKinsey analysis

breakthrough cost savings and capital intensity while maintaining or even increasing their scale.

To capitalize on these opportunities, executives must take bold action to transform their businesses. Managing networks with next-generation technologies can cut the capital-spending and operating expenses of wireless operators. And digital technology can help them

to streamline their business functions and please their customers, reducing costs and raising sales.

Wireless operators have little reason to wait before making these moves—the necessary technologies and management methods are available now. Moreover, operators can launch a digital transformation and begin reaping the benefits even as they

move into fast-growing adjacent markets or await favorable regulatory changes. In this article, we take a closer look at the prospects of mobile operators for digital reinvention and how they can exploit those opportunities.

Managing networks with next-generation technologies

Doing more with less is seldom easy. But leading-edge technologies help mobile operators do just that to meet the burgeoning demands on their networks. Network equipment is more sophisticated than ever, and analytics allows wireless operators to make smarter decisions about how they deploy capital and adjust their networks to maintain the quality of service.

The shift to small-cell networks has been one fundamental step toward next-generation technologies. Until recently, mobile networks consisted of expansive cells with modest capacity. To fix a service problem affecting only a small area within a cell, an operator had to enhance the network's coverage and capacity over the entire cell, including places where service was already good.

Now, technological advances have made it possible for wireless operators to set up and operate dense networks of small, high-capacity cells. These networks typically cost less to upgrade than networks of large cells do. Network equipment has gotten better as well: it is less costly to buy and operate, more flexible, and more powerful. Mobile operators can also use sophisticated analytical tools to gain insights into capturing the maximum value from capital investments.

Network technology is improving all the time, and the advances will probably accelerate in

several years, with the establishment of 5G wireless standards, which make it possible to serve more mobile users in a given area. Even so, mobile operators shouldn't delay making changes and await superior technology. The following applications can help these companies create more value right away.

Analytics for smarter capital spending

Advanced analytics can help mobile operators to determine which capital investments in their networks will produce the most value. Operators collect ample data about where, when, and how much subscribers use their mobile handsets. These data are precise: they can establish usage patterns within five-by-five-meter squares, roughly the size of a studio apartment, over the course of days and weeks.

By running the data through algorithms, a wireless operator can pinpoint where and when network overloads happen and which customers they affect most. With that information, it can project how much a possible upgrade might improve the satisfaction—and ultimately the retention—of its more profitable customers. An operator can also determine the highest levels of network performance that do not yield diminishing returns in customer satisfaction. Such findings let the company avoid investments that would make their networks better than necessary. With these techniques, mobile operators planning capital expenditures can prioritize value creation rather than network performance.

Machine learning for increased efficiency

Networks made up of small cells are not only less expensive to maintain than networks of large cells but also more

flexible. One benefit of flexibility is that operators can save money by reducing or increasing each cell's capacity as demand for service fluctuates. (Adjusting capacity is harder with large cells. Even if some areas in such a cell are experiencing low demand, its capacity has to be kept uniformly high to maintain the quality of service in areas where demand is strong.)

Much as operators can use analytics to determine where to make upgrades, they can also use machine learning to adjust wireless networks automatically as demand changes or even to base adjustments on predictions. If a machine-learning model has records of network usage and other conditions (such as traffic or weather) and then receives new data in real time, it can predict when usage might rise or fall across a network and adjust capacity preventively.

Software for better performance

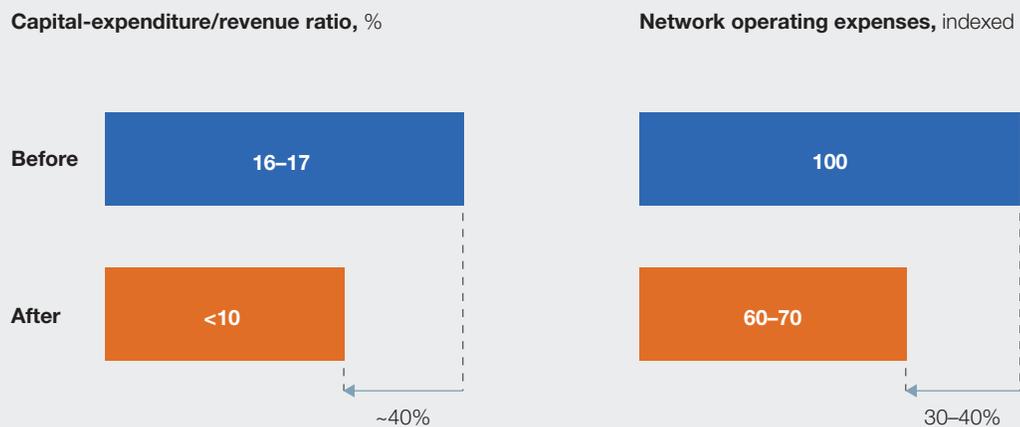
Improvements in software allow mobile companies to get significantly increased

performance from hardware they already own or to use less expensive hardware. New methods for compressing and managing video, for example, let wireless companies offer video-streaming services to ten times more households, thus creating new revenue streams. These methods can also cut data-storage costs by 60 percent.

Two other key technologies are software-defined networking and network-functions virtualization. These allow wireless operators to centralize the functions for controlling networks and to administer changes and upgrades remotely rather than in the field. Another benefit is that they let operators use generic network hardware, which tends to be more cost-effective.

All of these network technologies promise to lower costs and make it faster and easier to change networks in response to problems or new customer needs. We estimate that the newest technologies would let operators lower their capital expenditures by up to

EXHIBIT 2 New network technologies can increase the capital intensity of mobile operators and lower their operating expenses.



Source: McKinsey analysis

40 percent—thus pushing these costs down to under 10 percent of revenues—and their network-operating expenses by a similar amount (Exhibit 2).

Using digital to streamline operations and please customers

Mobile operators lag behind companies in some other industries in doing business digitally. For example, they make a smaller share of their sales online than insurance and retail-banking companies do. Closing this gap isn't just a matter of pride—it can boost financial performance and create competitive advantages.

Using digital technology to automate operations makes them leaner and more productive, which leads to lower costs. McKinsey research has also found that providing customer service through digital channels improves customer satisfaction—and that in turn leads to increases in revenue.² The opportunities to digitize support for mobile customers are especially promising. Our surveys indicate that more than half of European subscribers want to deal with providers only through digital channels and that more than a third of US subscribers are open to strictly digital interactions.

Both the technology and the know-how needed to digitize wireless operators are available today. In our experience, typical companies can make nearly every aspect of their business functions and customer experiences simpler, easier, faster, and more cost-effective. Here are the major opportunities we've identified.

Automation and simplification in the back office

Many mobile operators have essential processes that are more complex and labor intensive, and therefore more costly, than they have to be. These include dealing with business partners, budgeting, preparing compliance reports, and other essential functions. We estimate that just 20 to 30 processes generate 45 percent of the average operator's operating costs. Using advanced technologies, such as machine learning, to simplify and digitize those processes can cut costs by as much as one-third.

Excess complexity also pervades the systems and product lineups of mobile businesses. One company we know had 600 IT systems; another had 3,000 prepaid plans. Many wireless operators therefore stand to benefit from taking a fresh look at the needs of their businesses and customers and eliminating superfluous systems. To take one example, we estimate that a typical operator could trim the custom code in its customer-relationship-management system from 350,000 lines to 20,000—a 95 percent reduction—by removing unnecessary applications and features.

Digitization in customer support

A mobile operator we know reduced the number of support calls it fields by 90 percent after it set up sophisticated systems to track and anticipate the problems of its customers and to give them resources to solve those problems on their own. These systems typically provide three levels of support.

² Joao Dias, Oana Ionutiu, Xavier Lhuer, and Jasper van Ouwerkerk, "The four pillars of distinctive customer journeys," September 2016, McKinsey.com.

The first is self-care. Providing self-service guides and automatic tips about possible problems can help customers solve 75 percent of the issues themselves. Customers can solve an additional 15 percent of problems by using advice from instant-messaging chats (with employees or artificial-intelligence agents) or from online discussion groups. This leaves just 10 percent of problems to be handled at the costliest level of support: a phone call with a customer-service agent.

Predictive analytics in marketing and sales

With predictive models fed by customer information, mobile operators can develop cross-selling offers that appeal to individual customers and determine how best to reach them, down to the time of day. This approach, we believe, can add as much as two percentage points to a wireless operator's margins of earnings before interest, taxes, depreciation, and amortization. One company increased its sales from cross-selling campaigns by 25 percent once it started using analytics to plan those efforts.

Similarly, mobile operators can use analytics to increase their sales to existing customers. An analysis of customer data (in compliance with privacy-related legal and regulatory requirements) can suggest when each customer will be open to upgrading services or hardware, so that companies can make timely, appealing offers. Operators can also test and refine such offers before extending them widely.

Machine learning in customer retention

Mobile operators can use analytics to learn how to retain more of their subscribers yet spend

less doing so. By running massive sets of customer data (with as many as 300 variables) through machine-learning models, an operator can identify people who appear likely to cancel their service. Then it can woo them with offers aimed at the causes of their dissatisfaction.

Research by one mobile operator determined that 2 percent of its customers had a 48 percent likelihood of canceling their service in the next three months—a rate much higher than the 5 percent likelihood among its other customers. It divided the “likely churners” into segments based on the reasons they might cancel. The offers it extended to them, depending on their concerns, reduced cancellations by 15 percent. And because the operator targeted its outreach efforts precisely, it spent 40 percent less than it usually did to carry them out.

The use of customer data to improve retention points to other possibilities. Some telecom companies and banks have established data-sharing partnerships to gain customer insights that help them, for example, to develop products and manage fraud.³ The subscriber data that mobile operators collect could also be valuable for other kinds of companies, such as retailers, which might use the information to predict where people will be at any given moment and give them time- and location-specific offers.

Starting a mobile transformation

Using advanced technologies to manage wireless networks and digitize mobile operations can have a powerful effect on a mobile operator's financial performance.

³ For more, see *Blockchain in insurance—opportunity or threat?*, July 2016, McKinsey.com; and *Beyond the hype: Blockchains in capital markets*, December 2015, McKinsey.com.

Although companies can implement the changes selectively, the benefits of a comprehensive, coordinated program are greater because many of these moves reinforce one another. We estimate that a full digital-transformation effort would help a mobile operator to nearly double its cash-flow conversion within just five years (Exhibit 3).

Although each wireless operator will have to devise its own approach, a few general principles can benefit all operators as they embark on digital-transformation programs.

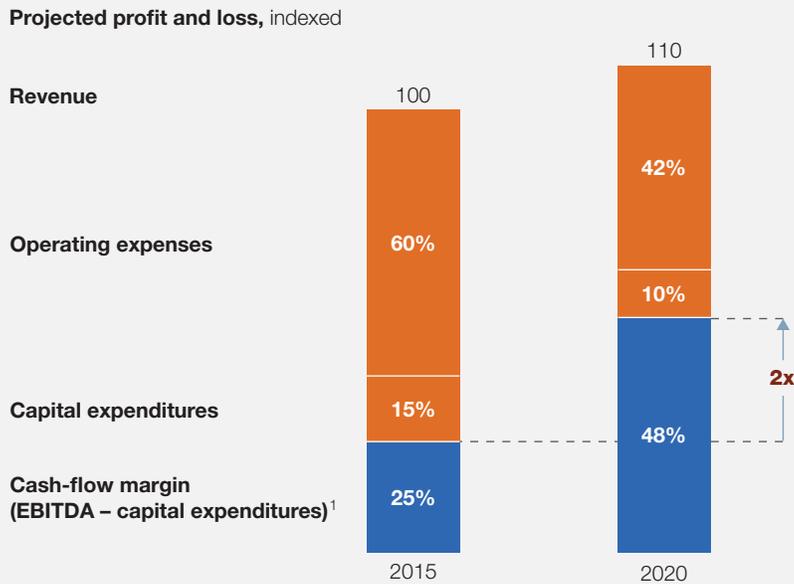
Aim high—then raise your sights

Many operators have responded to the steady pressure on margins by reducing costs incrementally—for instance, cutting

capital expenditures or call-center costs by 3 to 5 percent a year. Such modest cuts can help sustain margins but seldom produce big, lasting improvements. To make performance breakthroughs, the leaders of mobile operators must change their organizations in a fundamental way, starting with goals that might seem absurdly ambitious.

Reducing customer-service calls by 90 percent? Cutting lines of custom computer code by 95 percent? Doubling cash-flow margins in five years? These improvements would be unprecedented—yet they are realistic given the economics and structure of the mobile business today. And they can be attained only if executives of wireless operators challenge their companies to achieve them.

EXHIBIT 3 A comprehensive digital transformation could dramatically increase a mobile operator’s cash-flow margin.



¹Earnings before interest, taxes, depreciation, and amortization.

Source: McKinsey analysis

Reshape mind-sets and reorganize

The telecom industry's historical legacy as a utility-like sector still informs its competitive outlook. But the future of the mobile business will be defined in part by how well it develops capabilities essential in the digital economy, from designing products and user experiences to implementing analytics and artificial intelligence. Few wireless operators possess these capabilities today. To develop them, they will have to hire and train people in new ways, from the C-suite down through the ranks.

Mobile operators must also transform their organizations. If different departments handle activities related to the same part of the customer experience, those might need to be unified. Product managers might have to be reshuffled as operators consolidate portfolios. Companies should find a balance between the benefits and costs of reorganizing. One company we know chose to set up a new, all-digital mobile division rather than overhaul its legacy business.

Focus on execution

Setting ambitious goals and developing plans to achieve them are the first steps in transforming a mobile company. For those plans to succeed, managers must monitor

them and take corrective action when they fall behind schedule or veer off course. This focus on execution has to remain steady over the period needed to complete a wireless transformation. In most cases, the transformation will have to be directed by a team focusing on it alone. Any successful transformation also requires a commitment from the CEO and the rest of the leadership team, which must stay involved for the duration.



Large, capital-intensive businesses can resist major change. But technological advances in the mobile business have brought operators to a critical juncture. Now as never before, they have access to sophisticated network equipment, rich data on customers and operations, analytical power, and organizational prowess. As a result, mobile operators have an unprecedented opportunity to improve many measures of performance, from cash-flow conversion to customer satisfaction. Those that move boldly to transform themselves with these new capabilities stand to cut their costs and increase their revenues significantly, while building decisive advantages over their less ambitious competitors. ♦

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The next-generation operating model for the digital world

Albert Bollard, Elixabete Larrea, Alex Singla, and Rohit Sood

Companies need to increase revenues, lower costs, and delight customers. Doing that requires reinventing the operating model.

Companies know where they want to go. They want to be more agile, quicker to react, and more effective. They want to deliver great customer experiences, take advantage of new technologies to cut costs, improve quality and transparency, and build value.

The problem is that while most companies are trying to get better, the results tend to fall short: one-off initiatives in separate units that don't have a big enterprise-wide impact; adoption of the improvement method of the day, which

almost invariably yields disappointing results; and programs that provide temporary gains but aren't sustainable.

We have found that for companies to build value and provide compelling customer experiences at a lower cost, they need to commit to a next-generation operating model. This operating model is a new way of running the organization that combines digital technologies and operations capabilities in an integrated, well-sequenced way to achieve

step-change improvements in revenue, customer experience, and cost.

A simple way to visualize this operating model is to think of it as having two parts, each requiring companies to adopt major changes in the way they work:

- The first part involves a shift from running uncoordinated efforts within siloes to launching an integrated operational-improvement program organized around customer journeys (the set of interactions a customer has with a company when making a purchase or receiving services) as well as the internal journeys (end-to-end processes inside the company). Examples of customer journeys include a homeowner filing an insurance claim, a cable-TV subscriber signing up for a premium channel, or a shopper looking to buy a gift online. Examples of internal-process journeys include order to cash or record to report.
- The second part is a shift from using individual technologies, operations capabilities, and approaches in a piecemeal manner inside siloes to applying them to journeys in combination and in the right sequence to achieve compound impact.

Below, we examine each element of the model in detail, along with the necessary shifts.

Shift 1: From running uncoordinated efforts within siloes to launching an integrated operational-improvement program organized around journeys

Many organizations have multiple independent initiatives under way to improve performance, usually housed within separate organizational groups (for example, front and back office). This can make it easier to deliver incremental gains within individual units, but the overall

impact is most often underwhelming and hard to sustain. Tangible benefits to customers—in the form of faster turnaround or better service—can get lost due to hand-offs between units. These become black holes in the process, often involving multiple back-and-forth steps and long lag times. As a result, it's common to see individual functions reporting that they've achieved notable operational improvements, but customer satisfaction and overall costs remain unchanged.

Instead of working on separate initiatives inside organizational units, companies have to think holistically about how their operations can contribute to delivering a distinctive customer experience. The best way to do this is to focus on customer journeys and the internal processes that support them. These naturally cut across organizational siloes—for example, banks need marketing, operations, credit, and IT to support a customer opening an account. Journeys—both customer facing and end-to-end internal processes—are therefore the preferred organizing principle.

Transitioning to the next-generation operating model starts with classifying and mapping key journeys. At a bank, for example, customer-facing journeys can typically be divided into seven categories: signing up for a new account; setting up the account and getting it running; adding a new product or account; using the account; receiving and managing statements; making changes to accounts; and resolving problems. Journeys can vary by product/service line and customer segment. In our experience, targeting about 15 to 20 top journeys can unlock the most value in the shortest possible time.

We find that companies often fall into the trap of simply trying to improve existing processes. Instead, they should focus on

entirely reimagining the customer experience, which often reveals opportunities to simplify and streamline journeys and processes that unlock massive value. Concepts from behavioral economics can inform the redesign process in ingenious ways. Examples include astute use of default settings on forms, limiting choice to keep customers from feeling overwhelmed, and paying special attention to the final touchpoint in a series, since that's the one that will be remembered the most.

In 2014, a major European bank announced a multiyear plan to revamp its operating model to improve customer satisfaction and reduce overall costs by up to 35 percent. The bank

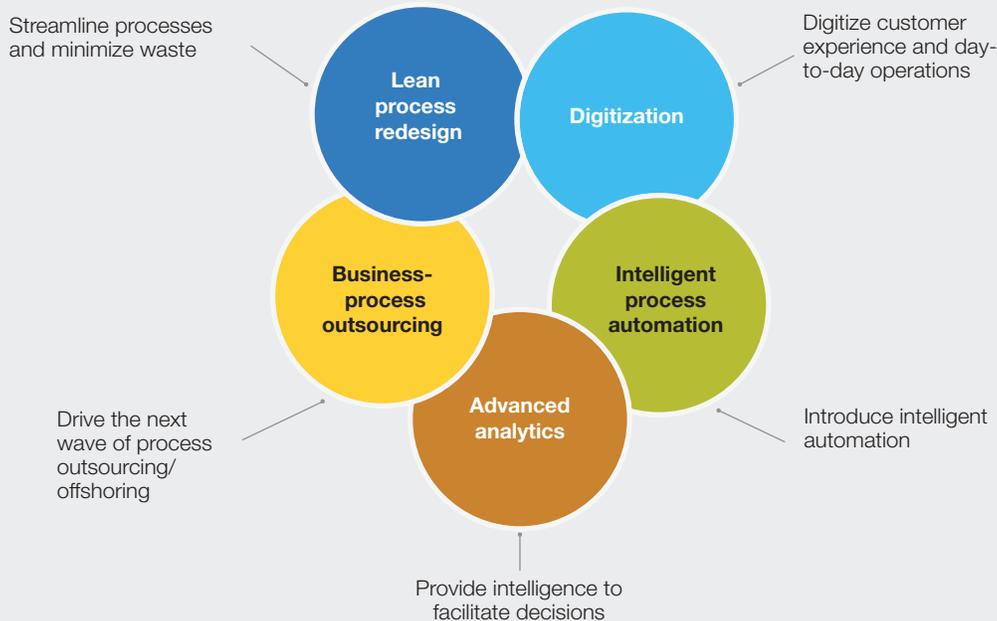
targeted the ten most important journeys, including the mortgage process, onboarding of new business and personal customers, and retirement planning. Eighteen months in, operating costs are lower, the number of online customers is up nearly 20 percent, and the number using its mobile app has risen more than 50 percent.¹

Shift 2: From applying individual approaches or capabilities in a piecemeal manner to adopting multiple levers in sequence to achieve compound impact

Organizations typically use five key capabilities or approaches (called “levers” here) to improve operations that underlie journeys (Exhibit 1):

¹ For more on reinventing customer journeys, see Shital Chheda, Ewan Duncan, and Stefan Roggenhofer, “Putting customer experience at the heart of next-generation operating models,” March 2017, McKinsey.com.

EXHIBIT 1 Five approaches and capabilities drive the next-generation operating model.



- **Digitization** is the process of using tools and technology to improve journeys. Digital tools have the capacity to transform customer-facing journeys in powerful ways, often by creating the potential for self-service. Digital can also reshape time-consuming transactional and manual tasks that are part of internal journeys, especially when multiple systems are involved.²
- **Advanced analytics** is the autonomous processing of data using sophisticated tools to discover insights and make recommendations. It provides intelligence to improve decision making and can especially enhance journeys where nonlinear thinking is required. For example, insurers with the right data and capabilities in place are massively accelerating processes in areas such as smart claims triage, fraud management, and pricing.
- **Intelligent process automation (IPA)** is an emerging set of new technologies that combines fundamental process redesign with robotic process automation and machine learning. IPA can replace effort in processes that involve aggregating data from multiple systems or taking a piece of information from a written document and entering it as a standardized data input. There are also automation approaches that can take on higher-level tasks. Examples include smart work flows (to track the status of the end-to-end process in real time, manage handoffs between different groups, and provide statistical data on bottlenecks), machine learning (to make predictions based on inputs and provide insights on recognized patterns), and cognitive agents (technologies that combine machine learning and natural-language generation to build a virtual workforce capable of executing more sophisticated tasks).³
- **Business-process outsourcing** uses resources outside of the main business to complete specific tasks or functions. This approach typically works best for processes that are manual, are not primarily customer facing, and do not influence or reflect key strategic choices or value propositions. The most common example is back-office processing of documents and correspondence.
- **Lean process redesign** helps companies streamline processes, eliminate waste, and foster a culture of continuous improvement. This versatile methodology works well on both short-cycle and long-cycle processes, transactional and judgment-based processes, and client-facing and internal processes.

Guidelines for implementing these levers

In considering which levers to use and how to apply them, it's important to think in a holistic way, keeping the entire journey in mind. Three design guidelines are crucial:

1. **Organizations must ensure that each lever is used to maximum effect.** Many companies believe they're applying the capabilities to the fullest, but they're actually not getting as much out of them as they could. Some companies, for example,

² Jacques Bughin, Laura LaBerge, and Anette Mellbye, "The case for digital reinvention," *McKinsey Quarterly*, February 2017, McKinsey.com.

³ For more, see Federico Berruti, Graeme Nixon, Giambattista Taglioni, and Rob Whiteman, "Intelligent process automation: The engine at the core of the next-generation operating model," March 2017, McKinsey.com.

apply a few predictive models and think they're really pushing the envelope with analytics—but in fact, they're only capturing a small fraction of the potential value. This often breeds a false complacency, insulating organizations from information that would otherwise drive them to higher performance, because processes are “already under way” or “have been tried.” Everyone has something under way in these kinds of domains, but it is the companies that press to the limit that reap the rewards. Executives need to be vigilant, challenge their people, and resist the easy answer.

In the case of analytics, for example, maxing out the potential requires using sophisticated modeling techniques and data sources in a concerted, cross-functional effort, while also ensuring that frontline employees execute in a top-flight way on the insights generated by the models.

2. Levers should be implemented in the right sequence. There is no universal recipe on sequencing these levers because so many variables are involved, such as an organization's legacy state and the existing interconnections between customer-facing and internal processes. However, the best results come when the levers can build on each other. That means, in practice, figuring out which one depends on the successful implementation of another.

Systematic analysis is necessary to guide decision making. Some institutions have started by outlining an in-house versus outsource strategy rooted in a fundamental question: “What is core to our value proposition?” Key considerations include whether the activities involved are strategic or confer competitive advantage or whether sensitive data or regulatory constraints are present.

The next step is to use a structured set of questions to evaluate how much opportunity there is to apply each of the remaining levers and then to estimate the potential impact of each lever on costs and customer experience. This exercise results in each lever being assigned an overall score to help develop a preliminary point of view on which sequence to use in implementing the levers.

There's also a need to vet the envisioned sequences in the context of the overall enterprise. For example, even if the optimal sequence for a particular customer journey is “IPA then lean then digital,” if the company's strategic aspiration is to become “digital first,” it may make more sense to digitize processes first.

This systematic approach allows executives to consider various sequencing scenarios, evaluate the implications of each, and make decisions that benefit the entire business.

3. Finally, the levers should interact with one another to provide a multiplier effect. For example, one bank only saw significant impact from its lean and digitization efforts in the mortgage-application journey after both efforts were working in tandem. A lean initiative for branch offices included a new scorecard that measured customer adoption of online banking, forums for associates to problem solve how to overcome roadblocks to adoption, and scripts they could use with customers to encourage them to begin mortgage applications online. This, in turn, drove up usage of online banking solutions. Software developers were then able to incorporate feedback from branch associates, which made future digital releases easier to use for customers. This in turn drove increased adoption of digital banking, thereby reducing the number of transactions done in branches.

Some companies have developed end-to-end journey “heat maps” that provide a company-wide perspective on the potential impact and scale of opportunity of each lever

on each journey (Exhibit 2). These maps include estimates for each journey of how costs can be reduced and how much the customer experience can be improved.

EXHIBIT 2

A heat map provides a company-wide integrated perspective of the potential for impact for each end-to-end journey.

INSURANCE EXAMPLE

■ High potential ■ Medium potential ■ Low potential

End-to-end journeys (not exhaustive)		BPO ¹	Digitization	AA ²	IPA ³	Lean	Cost, \$Xmn impact	CEX ⁴ impact
Sales	Sales specialists						■	■
Policy issuance (underwriting)	UW⁵ new business	■	■	■	■	■	■	■
	UW amendments						■	■
	UW renewals						■	■
	UW support						■	■
Servicing	Policy change/cancellation						■	■
	Policy renewals						■	■
Claims	First notice of loss	■	■	■	■	■	■	■
	Auto appraisal						■	■
	Property appraisal						■	■
	Adjusting						■	■
	Auto and property subrogation						■	■
	Claims SIU ⁶ /fraud						■	■
	Claims support						■	■
Supporting functions	Finance: Billing and collection	■	■	■	■	■	■	■
	Operations						■	■
	Information services						■	■
	Actuarial						■	■
	HR						■	■

¹Business-process outsourcing.
²Advanced analytics.
³Intelligent process automation.
⁴Customer experience.
⁵Underwriting.
⁶Special investigative unit.

Companies find heat maps a valuable way to engage the leadership team in strategic discussions about which approaches and capabilities to use and how to prioritize them.

Case example: The ‘first notice of loss’ journey in insurance

In insurance, a key journey is the first notice of loss (FNOL), when a customer files a claim. FNOL is particularly challenging for insurers because they must balance multiple objectives at the same time: providing a user-friendly experience (for example, by offering web or mobile interfaces that enable self-service), managing expectations in real time through alerts or updates, and creating an emotional connection with customers who are going through a potentially traumatic situation—all while collecting the most accurate information possible and keeping costs in line.

Many companies have relied on lean to improve FNOL call-center performance. One leading North American insurer, however, discovered it could unlock even more value by sequencing the buildout of three additional capabilities, based on the progress it had already made with lean:

Digitization. This company improved response times by using digital technologies to access third-party data sources and connect with mobile devices. With these new tools, the insurer can now track claimant locations and automatically dispatch emergency services. Customers can also upload pictures of damages, and both file and track claims online. The insurer also allows some customers to complete the entire claims

process without a single interaction with a company representative.

Advanced analytics. Digitization of the FNOL journey provided the insurer with more and better data faster, which in turn allowed its analytics initiative to be more effective. Now able to apply the latest modeling capabilities to better data, the company is using advanced analytics to improve decision making in the FNOL journey. For example, intelligent triage is used to close simple claims more quickly, and smart segmentation identifies claims likely to be total losses and those liable to require the special investigative unit far earlier than before. Analytics are even being used to predict future staffing needs and inform scheduling and hiring, thereby allowing both complex and simple claims to be handled more efficiently.

IPA. Once digital and analytics were in place, IPA was implemented. Automation tools were deployed to make some formerly manual and time-consuming tasks more efficient, such a looking up policy numbers or data from driving records. In addition to reducing costs, IPA sped up the process and reduced errors. IPA came last because the streamlining achieved by digitization and more effective use of analytics had eliminated some manual processes, so the IPA effort could focus only on those that remained.

By combining four levers—lean plus digital, analytics and IPA—this insurer drove a significant uplift in customer satisfaction while at the same time improving efficiency by 40 percent.⁴

⁴ Property Casualty Insurers Association of America Executive Roundtable Seminar, Naples, Florida, February 12–14, 2017, pciaa.net. For more approaches to improving claims, see “Next-generation claims operating model: From evolution to revolution,” forthcoming on McKinsey.com.

Bringing it all together: Avoid creating new silos by thinking holistically

Senior leaders have a crucial role in making this all happen. They must first convince their peers that the next-generation operating model can break through organizational inertia and trigger step-change improvements. With broad buy-in, the CEO or senior executive should align the business on a few key journeys to tackle first. These can serve as beacons to demonstrate the model's potential. After that comes evaluation of the company's capabilities to determine which levers can be implemented

using internal resources and which will require bringing in resources from outside. Finally, there is the work of actually implementing the model.⁵



Transformation cannot be a siloed effort. The full impact of the next-generation operating model comes from combining operational-improvement efforts around customer-facing and internal journeys with the integrated use of approaches and capabilities. ♦

⁵ For more, see "How to build out your next-generation operating model," forthcoming on Mckinsey.com.

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